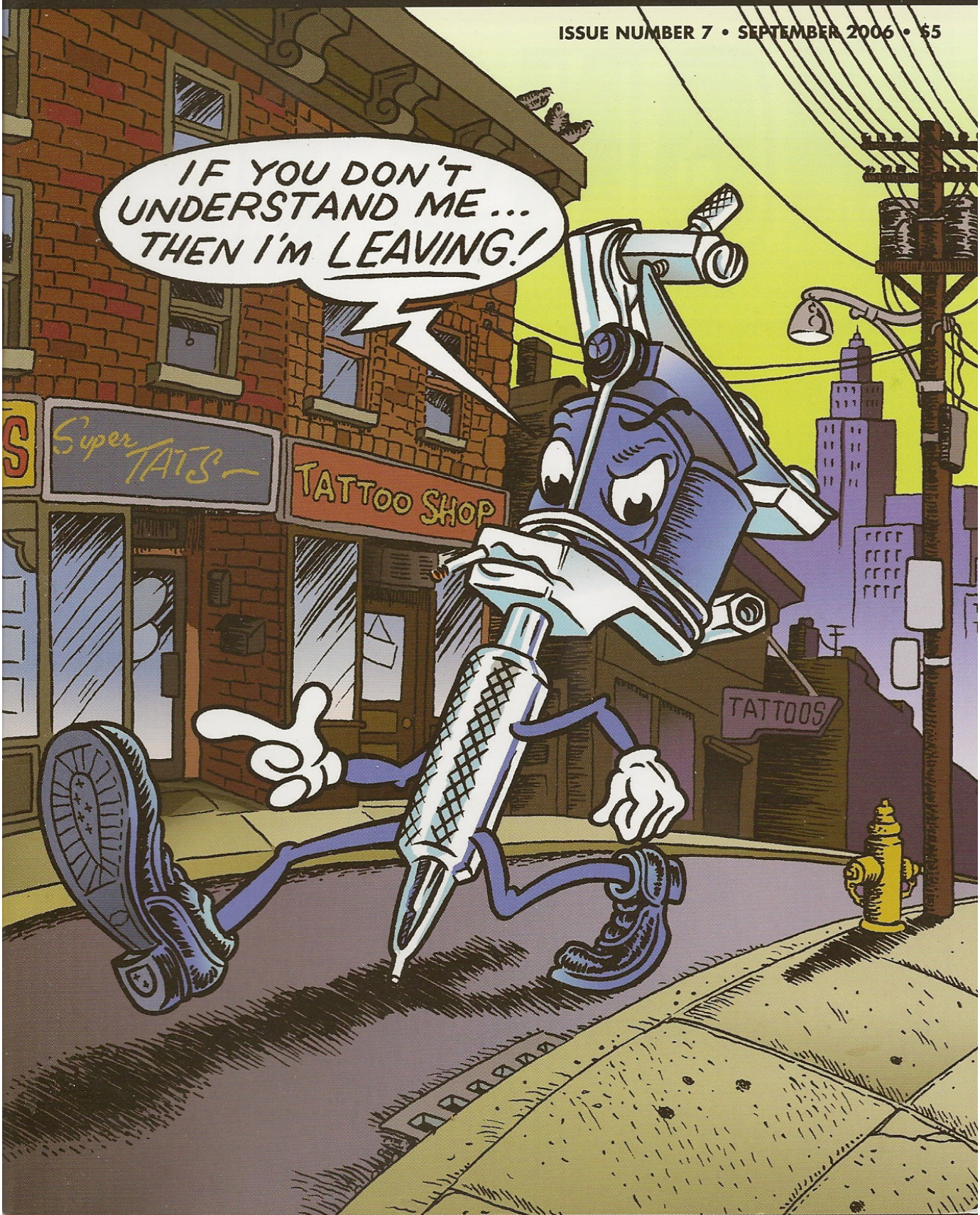
MACHINEGUN

ISSUE NUMBER 7 • SEPTEMBER 2006 • $5



GOT AN HOUR?

MAKE A MONSTER

Complete kits can easily be assembled by **MOST TATTOO ARTISTS** in under an hour.

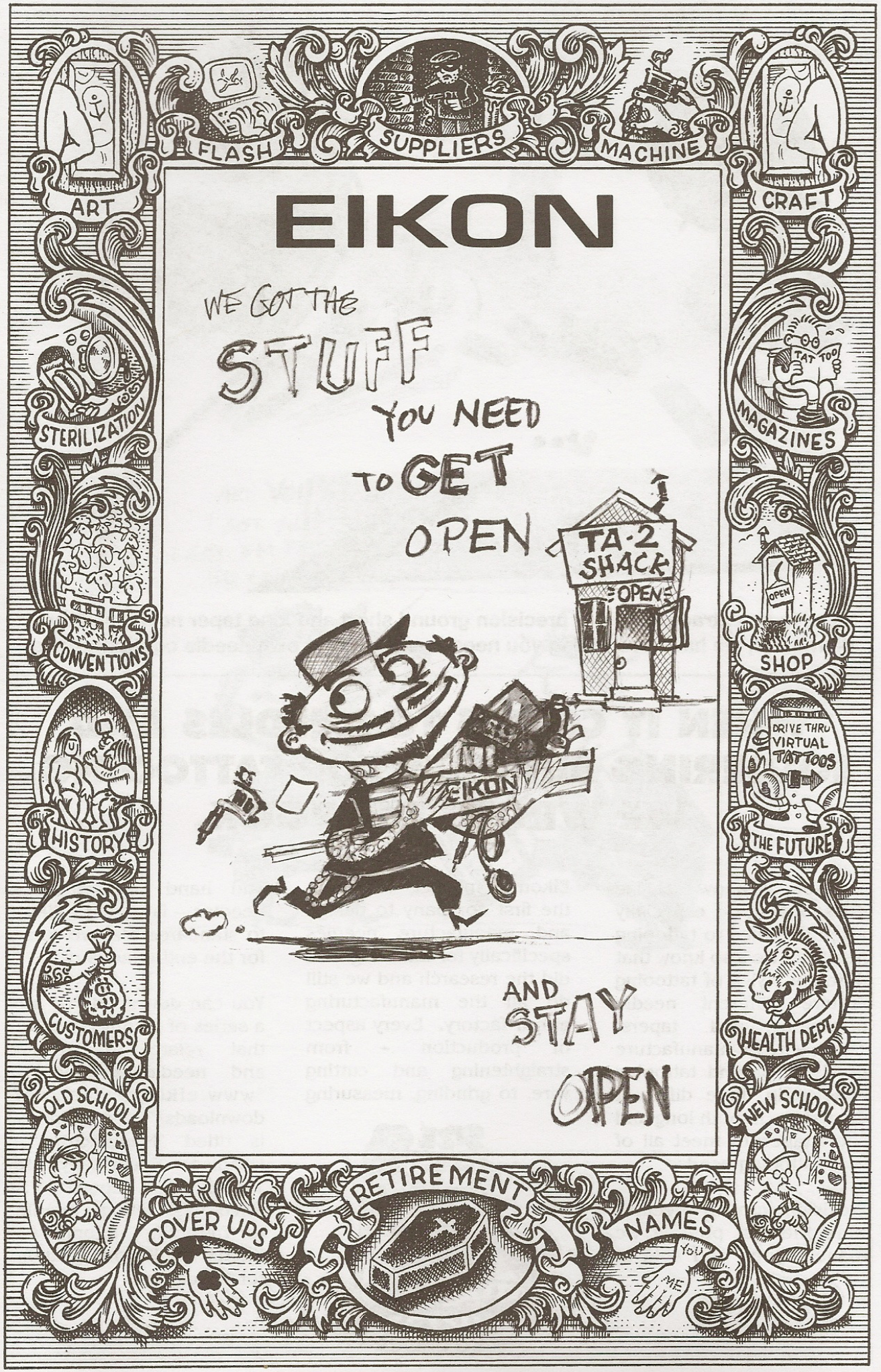
Liner, Shader and Coloring Machine Kits

Build 'em MILD or WILD

EIKON

GREEN MONSTER

Tattoo Machines


FLASH
SUPPLIERS
MACHINE
ART
CRAFT
EIKON
WE GOT THE
STUFF
YOU NEED
TO GET
OPEN
TA-2 SHACK
OPEN
EIKON
STERILIZATION
MAGAZINES
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HISTORY
DRIVE THRU VIRTUAL TATTOOS
THE FUTURE
AND
STAY
OPEN
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From fume extractors to our precision ground short and long taper needles in three diameters, we have everything you need to solder your own needle configurations.

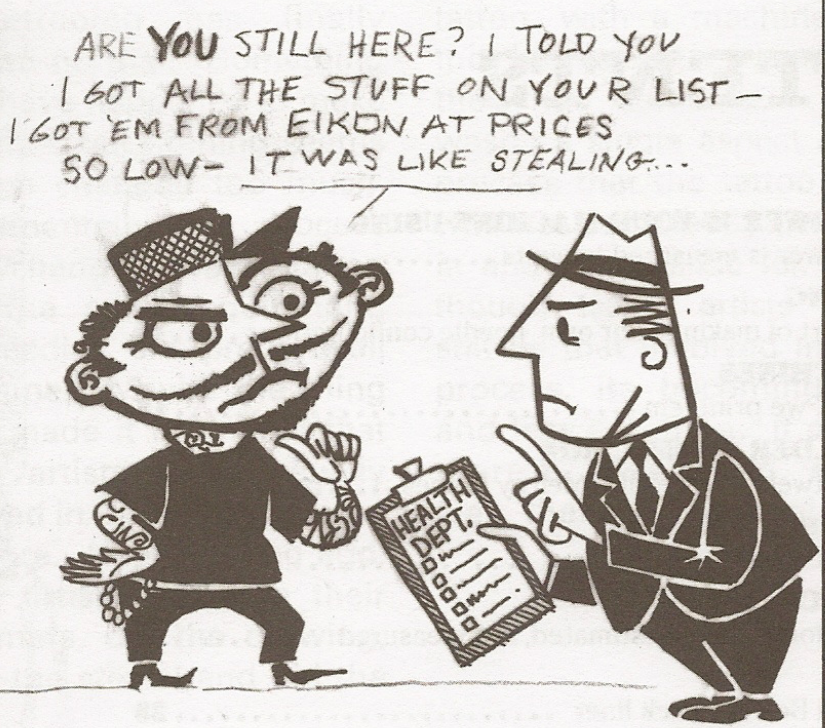
WHEN IT COMES TO NEEDLES AND SOLDERING SUPPLIES FOR TATTOOING, WE WROTE THE BOOK.

At Eikon, we know that size does matter - especially when it comes to tattooing needles. We also know that different styles of tattooing require different needle diameters and tapers. That's why we manufacture precision ground tattooing needles in three different diameters, in both long and short taper, to meet all of your tattooing needs.

Precision ground needles were the first product we manufactured and sold at Eikon. In fact, we were the first company to design and manufacture needles specifically for tattooing. We did the research and we still do all the manufacturing at our factory. Every aspect of production – from straightening and cutting wire, to grinding, measuring and hand packaging the needles – is done at Eikon, to standards that we've set for the entire industry.

You can download PDF's of a series of technical reports that relate to needles and needle making at: "www.eikondevice.com/downloads/". Report #2 is titled "Manufacture of Needles Specifically for Tattooing". Report #3 is titled "Soldering Needles for Tattooing". Report #4 is titled "Needle Configurations for Tattooing".

EIKON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I GOT ALL THE STUFF ON YOUR LIST—
I GOT 'EM FROM EIKON AT PRICES
SO LOW— IT WAS LIKE STEALING...
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THE TATTOO MACHINE BIBLE
ISSUE NUMBER 7 • SEPTEMBER 2006

PUBLISHER
EDITOR
TECHNICAL EDITOR
ASSOCIATE EDITOR
DESIGN AND LAYOUT
PRODUCTION MANAGER
CONTRIBUTORS

The beautiful thing about buying collector tattoo machines is, you never paid too much... you just bought early.

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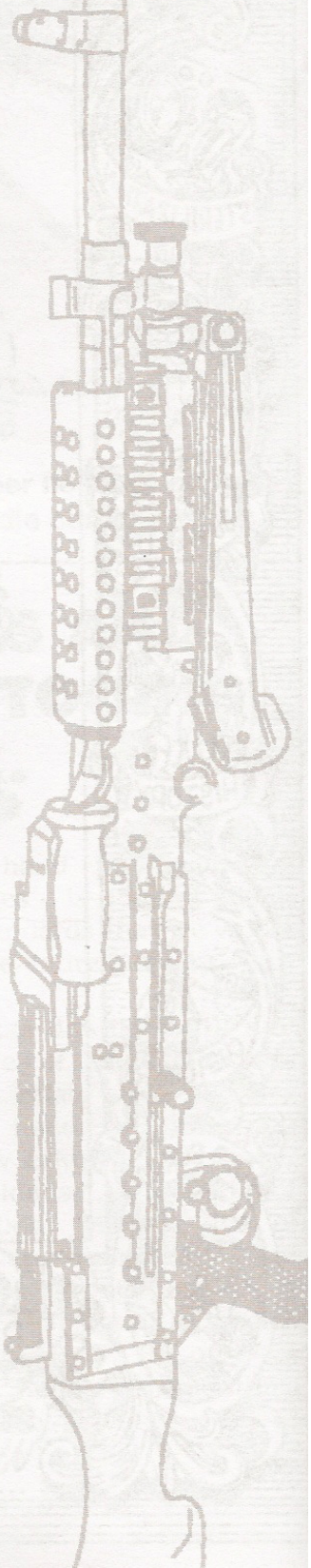

EIKON DEVICE INC.™
BILL BAKER
DEAN BYRNES
MONIKA STENGELE
DEREK ROWCLIFFE
BEN CAMPBELL
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THE USUAL RUBBISH, but with influence from:
Front Cover: Robert Crumb, then Filip Leu
Border On Pages 3,5 and 48: Mad Magazine 1950's
Page 20 & 21: Lyle Tuttle Machine Poster
Page 9: "POWER" Sign built by Nikola Tesla

EDITORIAL

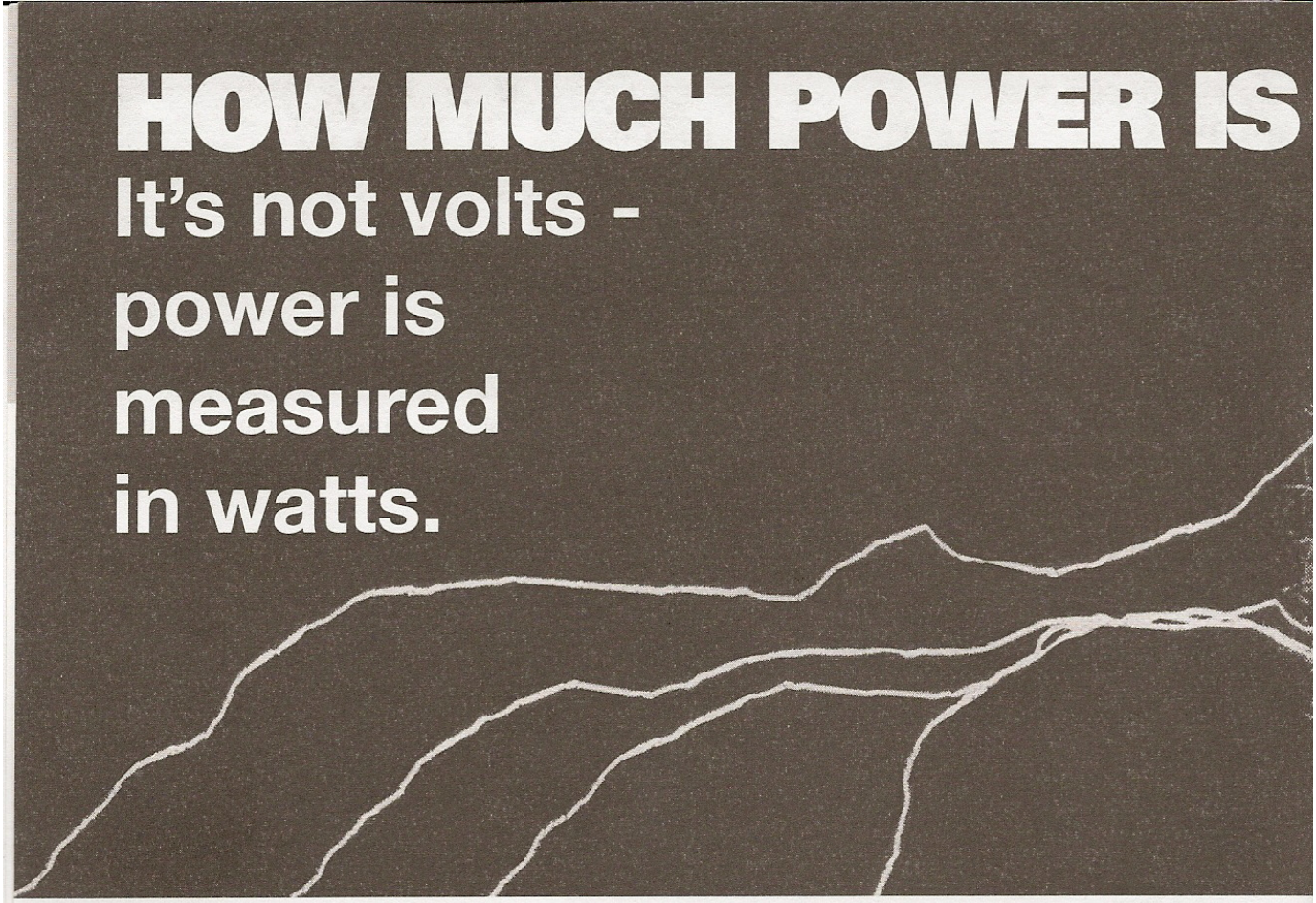
BY BILL BAKER

So tattooing has finally become normal. Something must have happened to make it normal, but nothing seems to have changed too much. Fundamentally, the process hasn't changed. We still tattoo with the same equipment, the needles are pretty well the same. Maybe the thing that's made it normal is that tattoo artists aren't usually involved in the whole process anymore. Not that long ago, tattoo artists spoke to their customers, did the drawing, made the stencil and did the tattoo, with a machine that they had set-up, using needles they had soldered. There wasn't a single aspect of the process that the tattoo artist was not completely involved in and responsible for. Even though tattoo artists could still be that involved in their process, its becoming less and less common. It seems there's always an easier way, that's just normal. **MGM**

Maybe the thing that's made it normal is that tattoo artists aren't usually involved in the whole process anymore.

HOW MUCH POWER IS

It's not volts - power is measured in watts.



OHM'S LAW

A current flowing through a conductor is directly proportional to the electrical force that produces it. In an equation that represents Ohm's Law, E represents electromotive force, measured in volts; I represents electric current, measured in amperes; and R represents electrical resistance, or Ohms. The relationship is then expressed as:

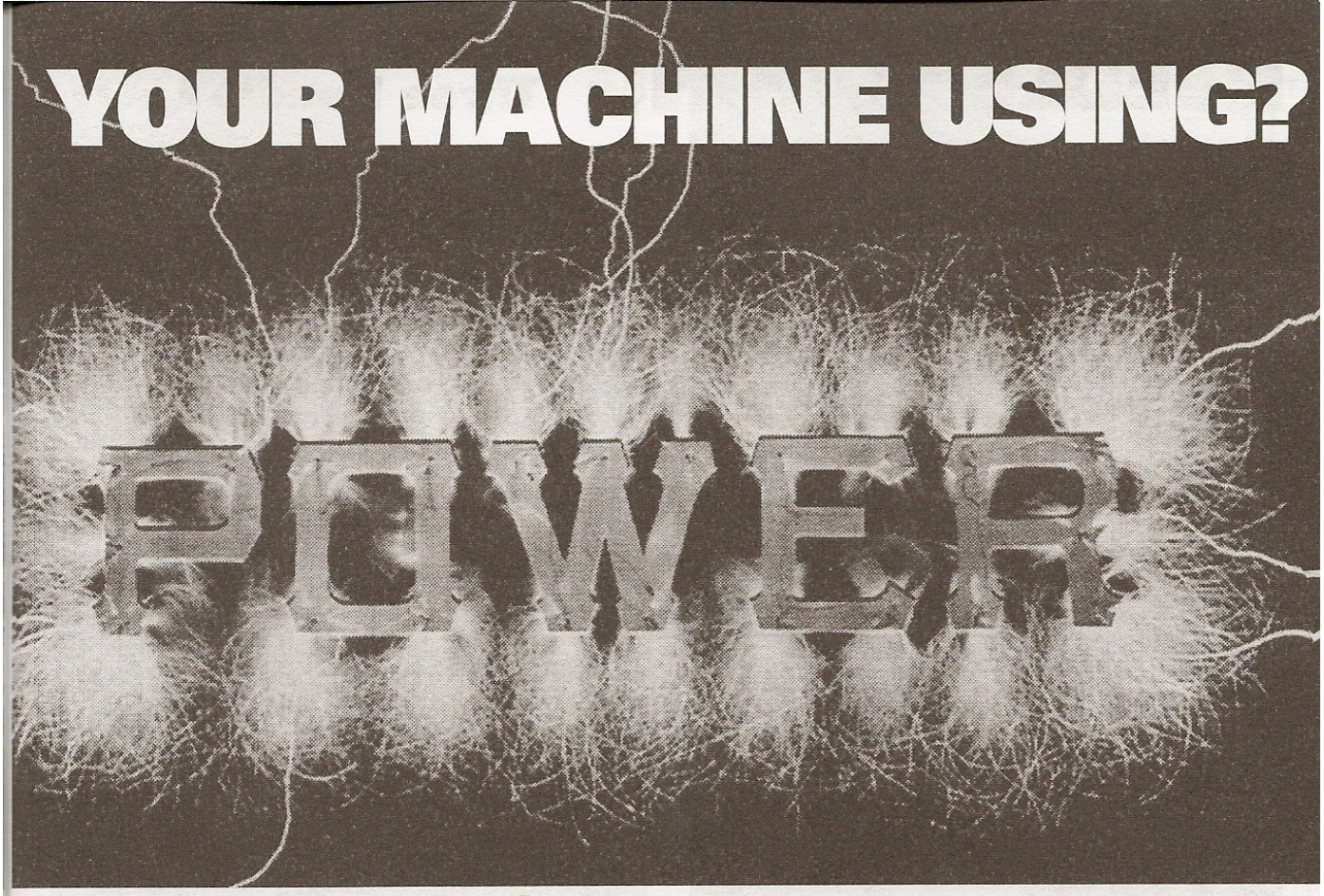
$$E = IR$$

That is:

VOLTS = AMPS x OHMS

In the case of a tattoo machine, we generally know two of the measurements, volts and the resistance of the coils. To find the amps, take volts divided by resistance:

VOLTS / OHMS = AMPS



WATTAGE

Wattage is a unit for measuring power. In electricity, a watt is equal to the flow of one ampere at a pressure of one volt.

WATTS = VOLTS X AMPS

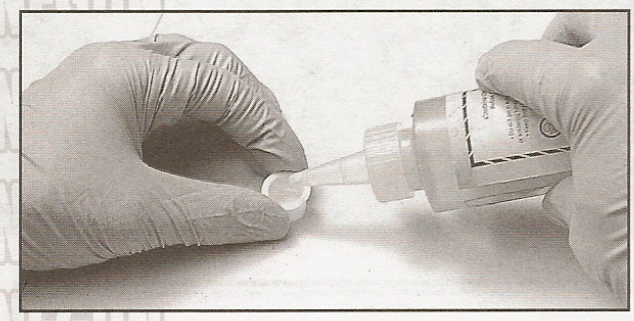
For example, a machine with a pair of coils that have a resistance of 2 ohms, running at 6 volts will have 3 amps of current. The wattage for that machine set-up would be 18 watts. There is another way to calculate power if only the voltage and the resistance are known: WATTS = VOLTS X VOLTS / RESISTANCE for example if the voltage is 6 V and the resistance is 2 ohms the wattage is 6 X 6 / 2 = 18 W.

Excessive wattage will result in an overheating machine.

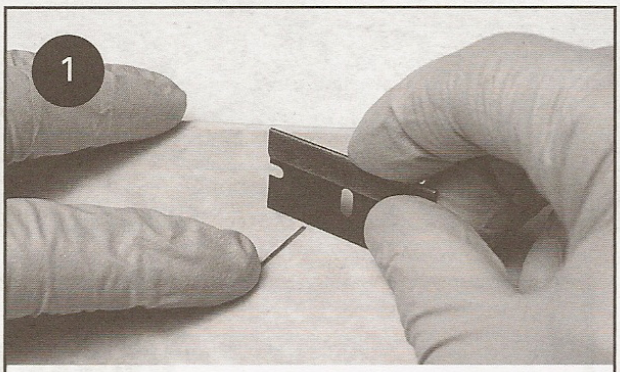
- Decreasing resistance and voltage can actually increase wattage on some set-ups.
- If you do not alter the resistance of your machine (and you won't unless you change the coils) decreasing the voltage will decrease the wattage.
- If you do not alter the resistance of your machine, doubling voltage will quadruple the wattage. Even slight changes to voltage make significant changes to wattage.

NEEDLE MAKING Three Needle Liner

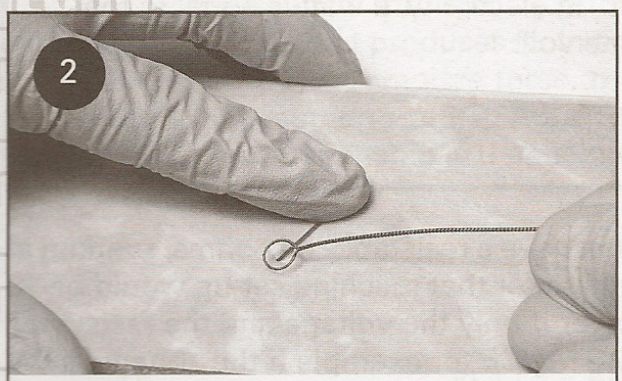
Tools and Materials Needed:
Soldering iron, fume extractor, ceramic tile, single edge razor blade, drill gauge, eye loupe, pliers, needles, needle bars, grommets, flux, silver solder, and baking soda.



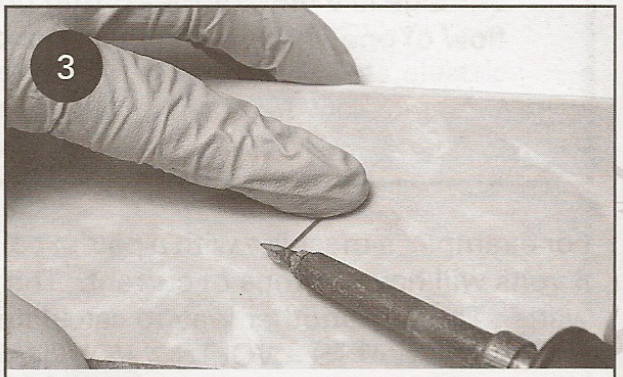
Put some flux into an ink cap, this will make it easier to tin needle bars. You can use a small dipper to apply flux while soldering.



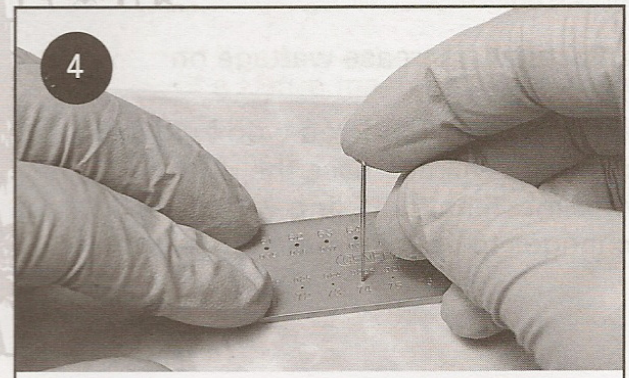
Line up needle points against razor blade.



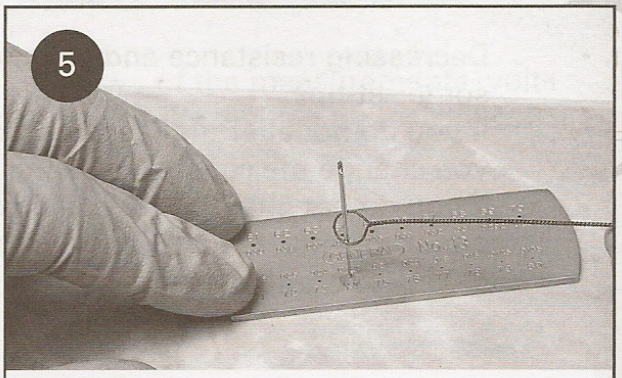
Flux end of needles.



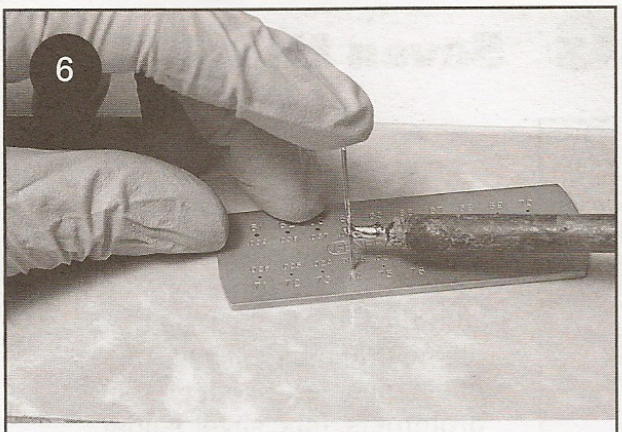
Tack end of needles with solder.



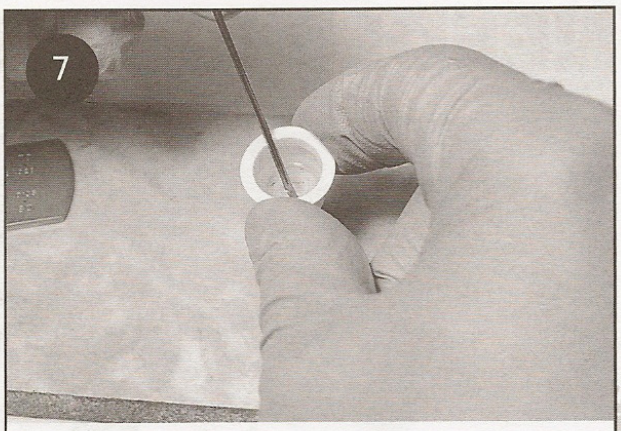
Work points of needles into draw plate.



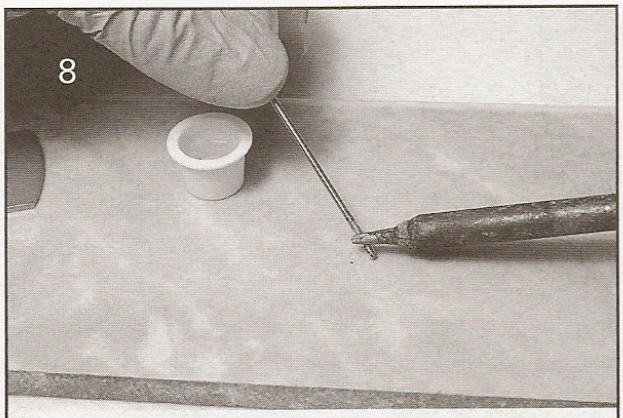
Flux needles.



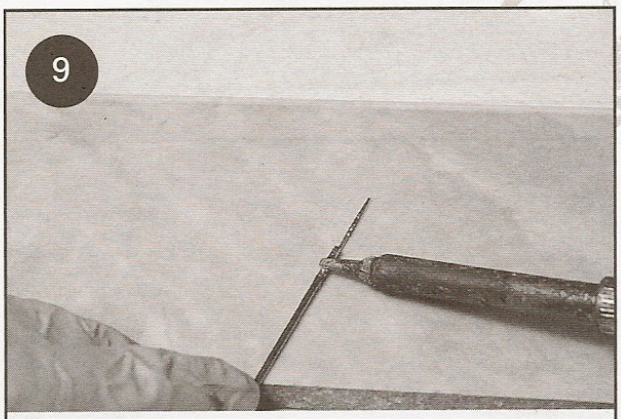
Solder configuration.



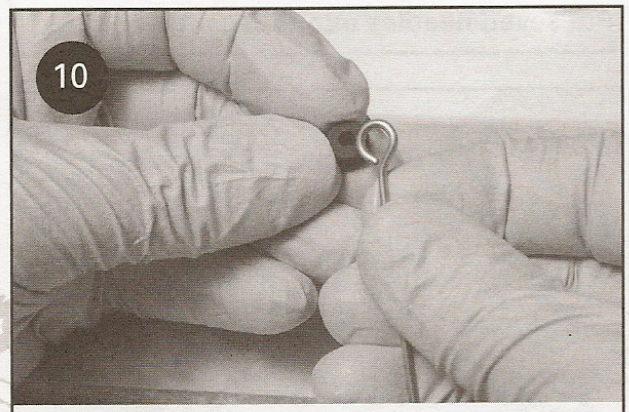
Flux needle bar.



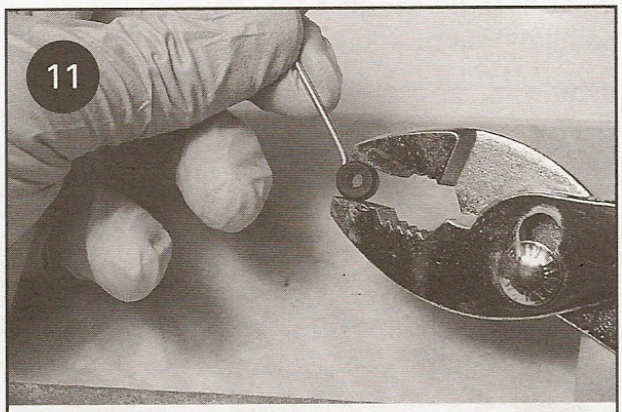
Tin needle bar.



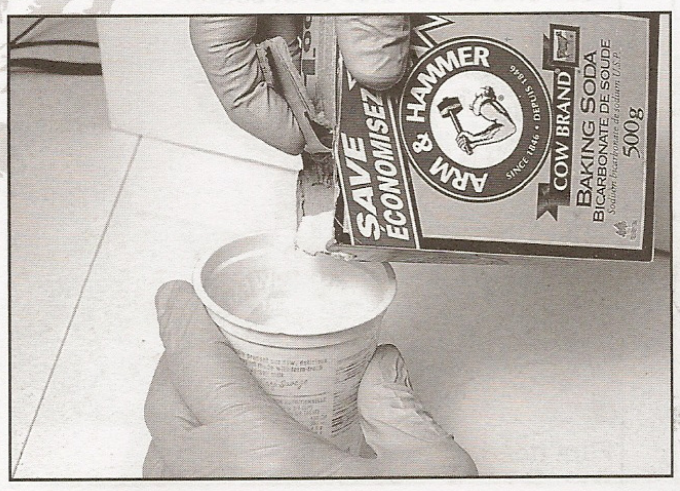
Solder bar to configuration.



Push grommet into eye of needle bar.



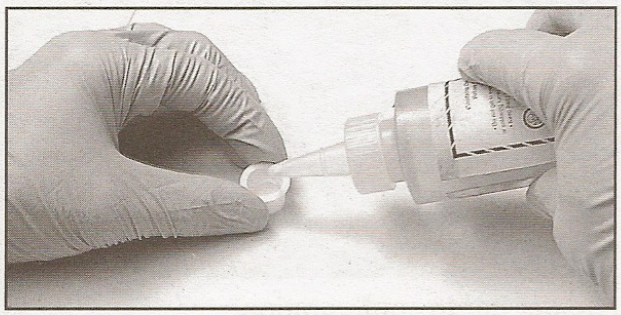
Crimp eye of needle bar tight.



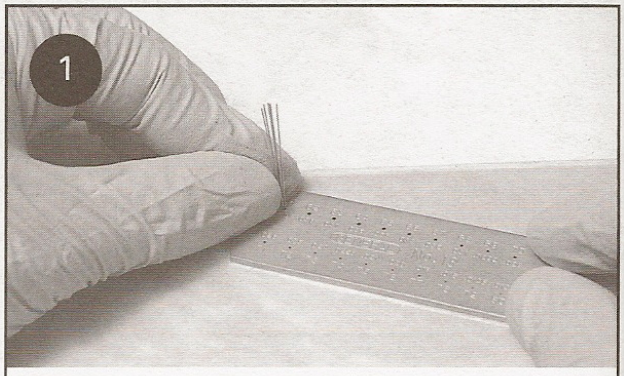
When soldering is finished, everything that has come into contact with flux must be cleaned with soap and water, then neutralized with a solution of baking soda and water, and thoroughly rinsed and dried.

NEEDLE MAKING Seven Needle Liner

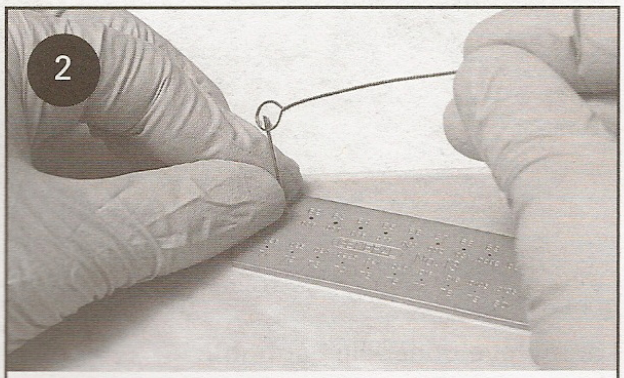
Tools and Materials Needed:
Soldering iron, fume extractor, ceramic tile, single edge razor blade, drill gauge, eye loupe, pliers, needles, needle bars, grommets, flux, silver solder, and baking soda.



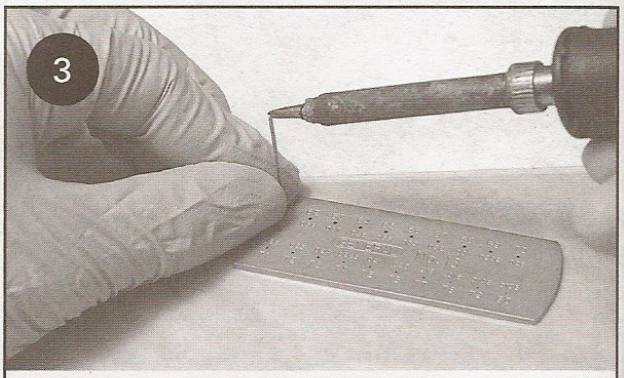
Put some flux into an ink cap, this will make it easier to tin needle bars. You can use a small dipper to apply flux while soldering.



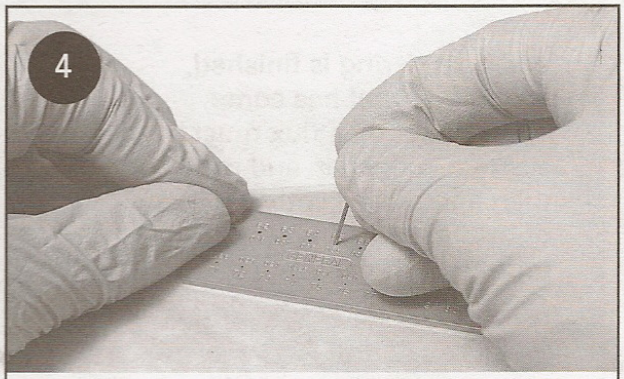
Put seven needles into drill gauge hole.



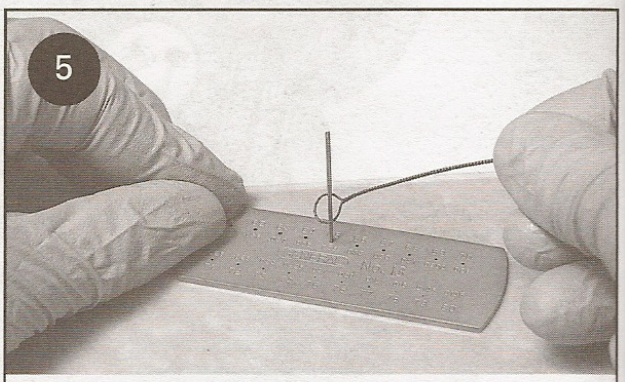
Flux end of needles.



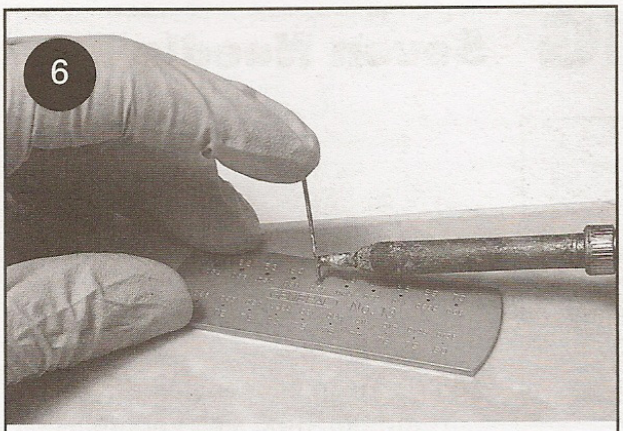
Tack end of needles with solder.



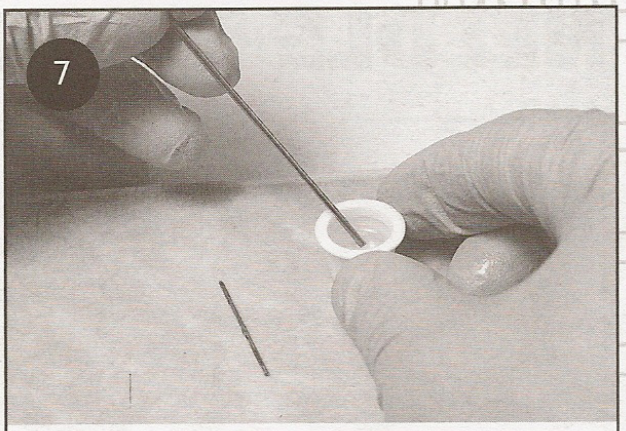
Work points of needles into smaller hole.



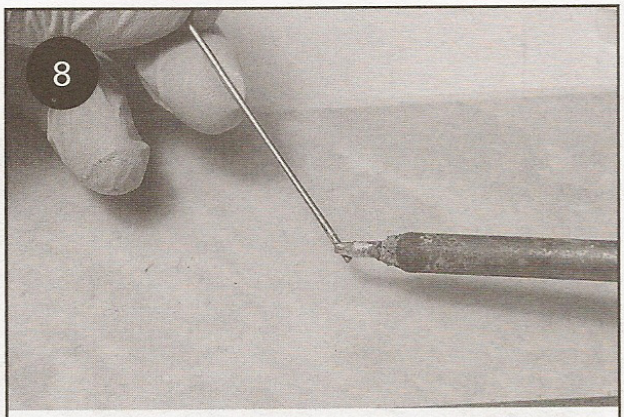
Flux needles.



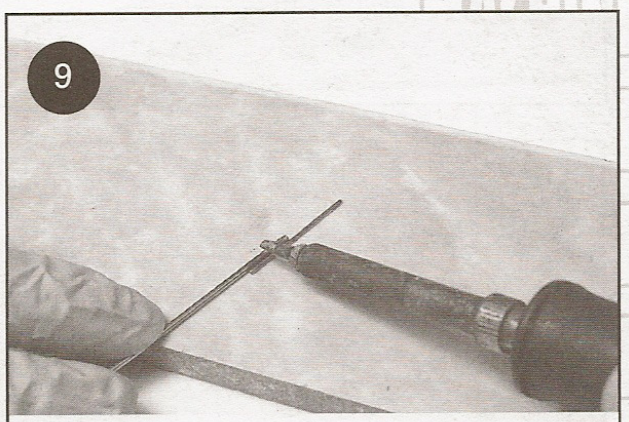
Solder configuration.



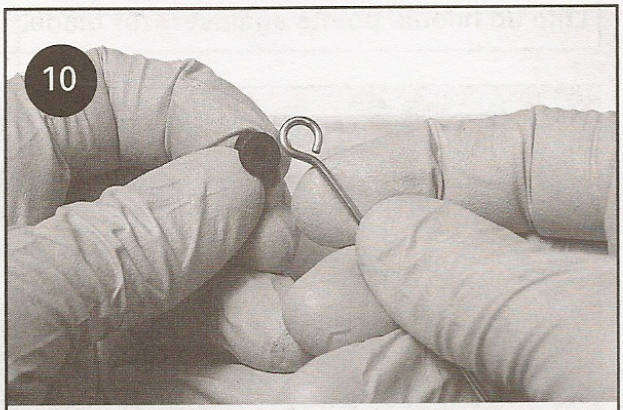
Flux needle bar.



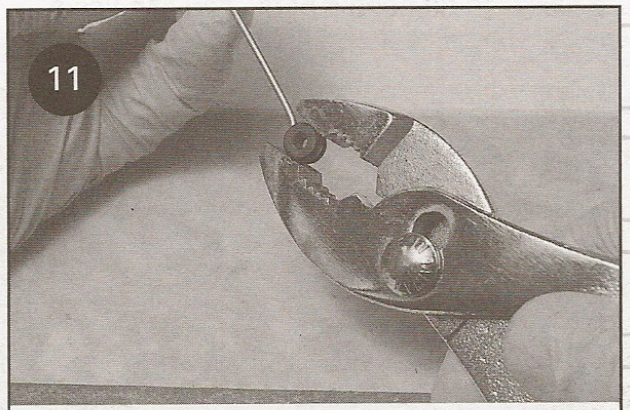
Tin needle bar.



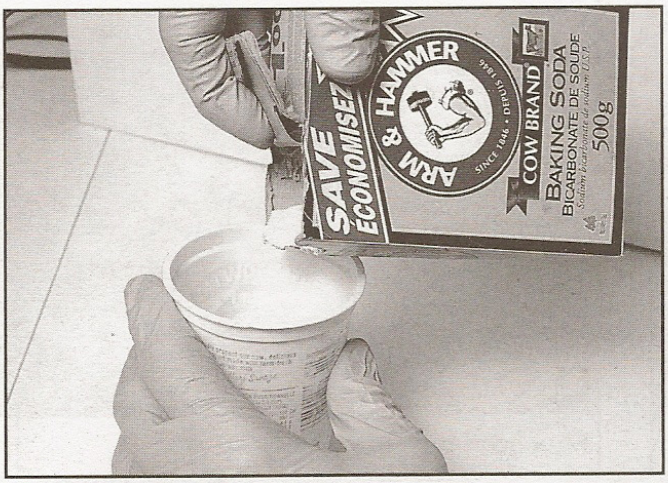
Solder configuration to bar.



Push grommet into eye of needle bar.



Crimp eye of needle bar tight.



When soldering is finished, everything that has come into contact with flux must be cleaned with soap and water, then neutralized with a solution of baking soda and water, and thoroughly rinsed and dried.

NEEDLE MAKING Seven Needle Mag

Tools and Materials Needed:
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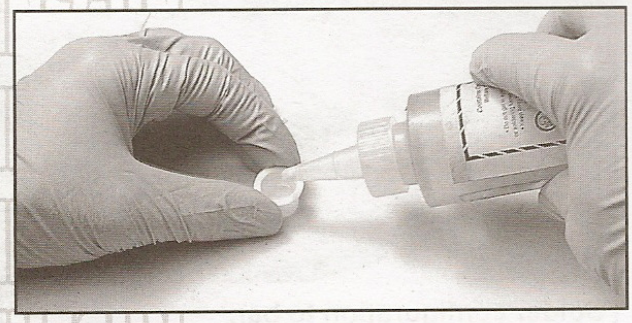

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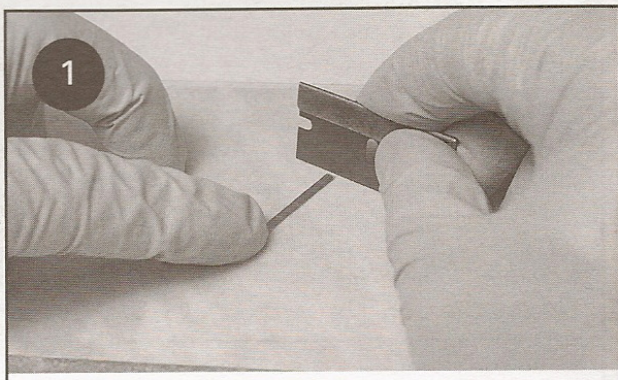
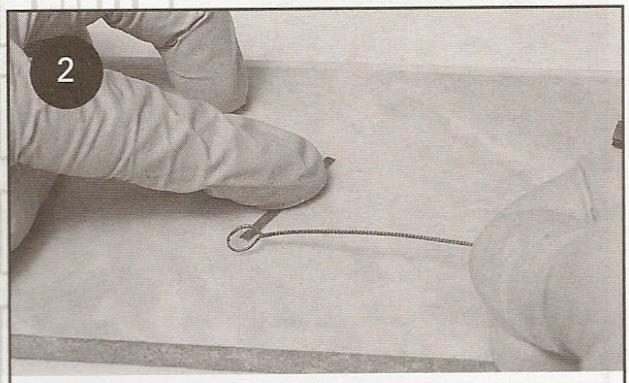
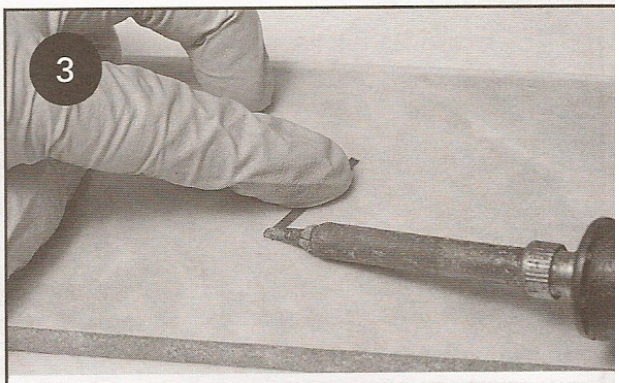


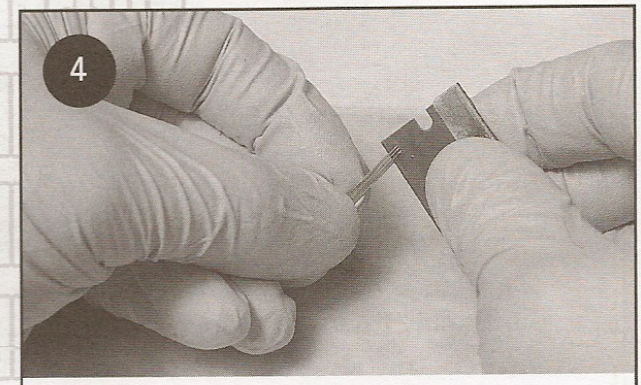
Line up needle points against razor blade.



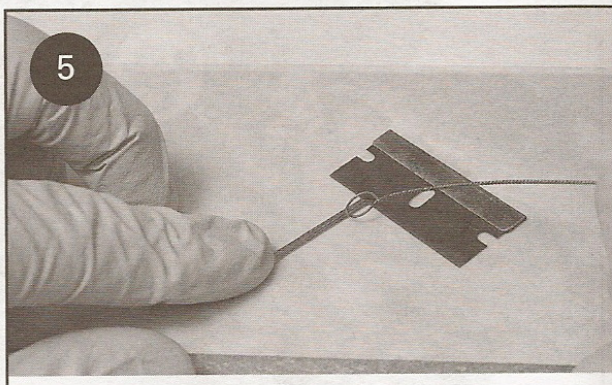
Flux end of needles.



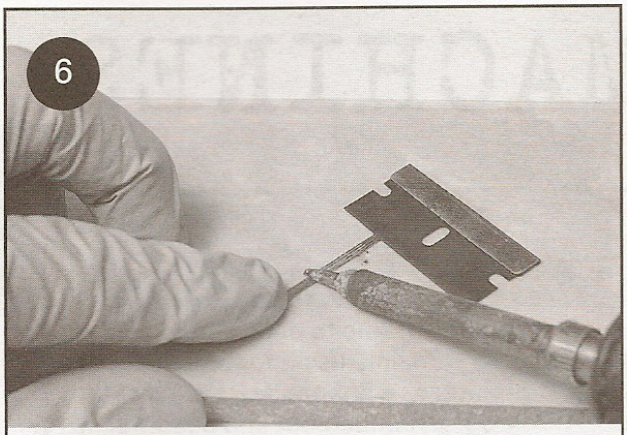
Tack end of needles with solder.



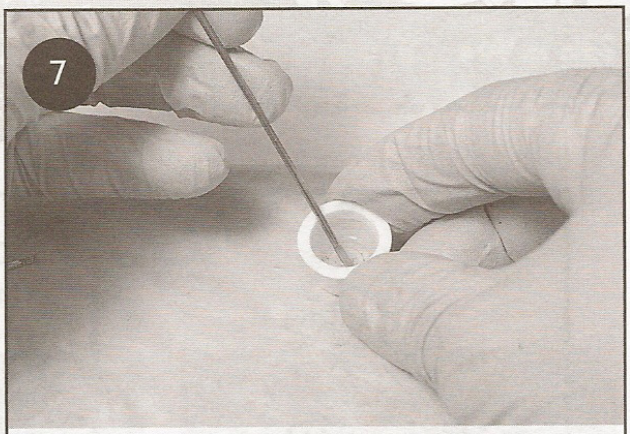
Weave razor blade through needles.



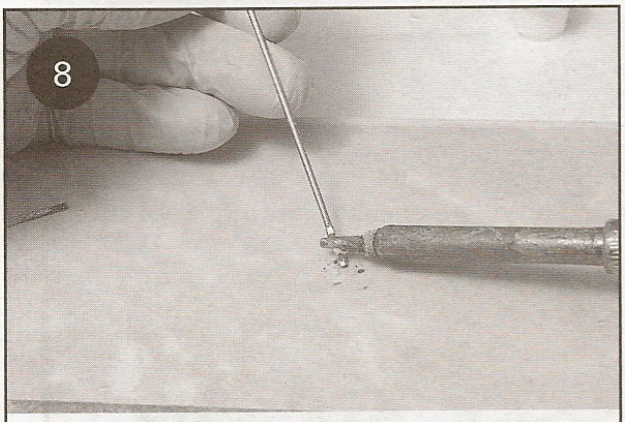
Flux configuration.



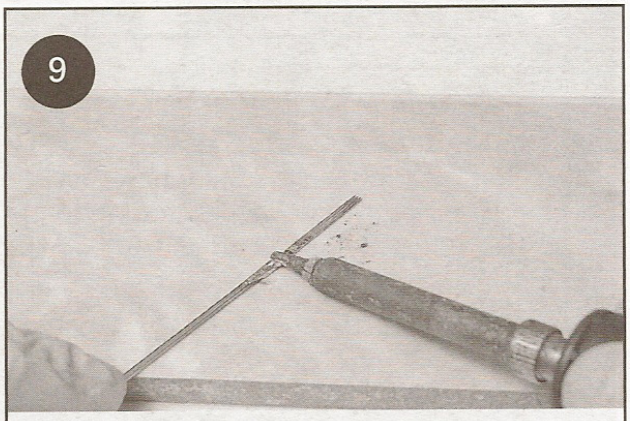
Solder configuration.



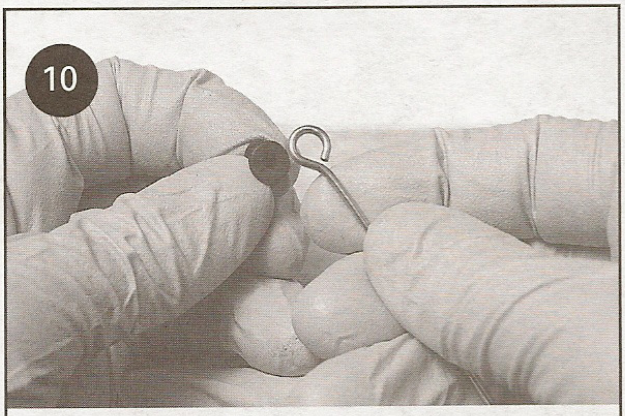
Flux needle bar.



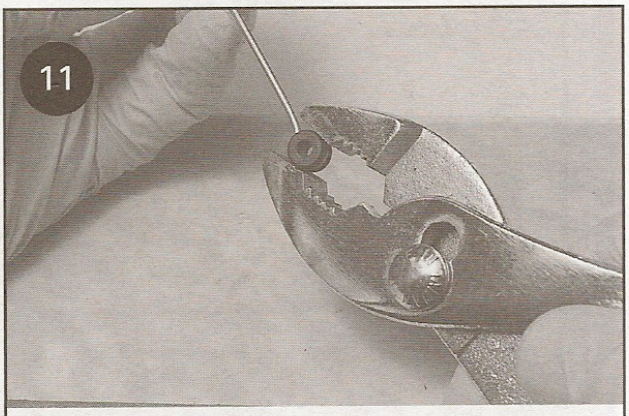
Tin needle bar.



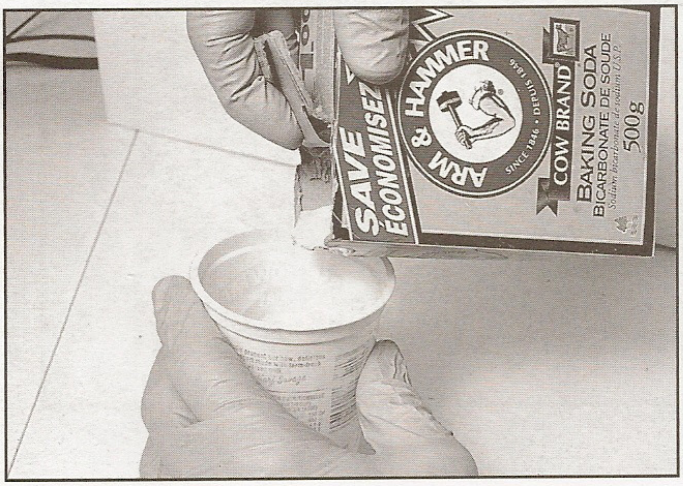
Solder configuration to bar.



Push grommet into eye of needle bar.

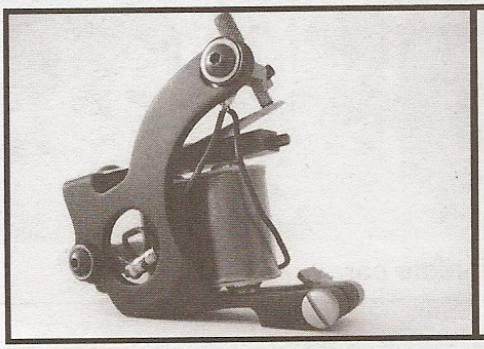


Crimp eye of needle bar tight.



When soldering is finished, everything that has come into contact with flux must be cleaned with soap and water, then neutralized with a solution of baking soda and water, and thoroughly rinsed and dried.

READERS MACHINES



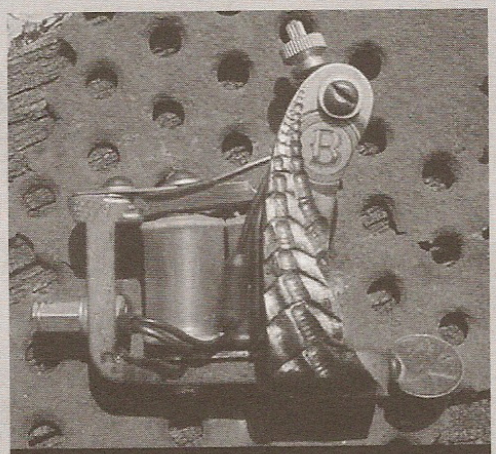
Goriri

Kingston, Ontario, Canada

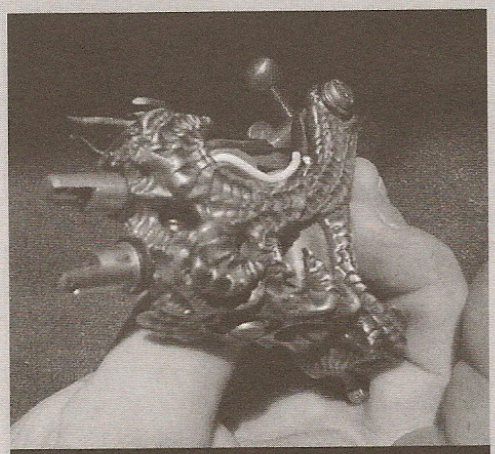
This is my first and only frame to date, a personally modified Spaulding. I mainly use it for practice setting up and running as a liner and shader. Stripped of its chrome, rounded out and beautiful in black, this frame is otherwise fully Eikon equipped down to its core.

BAD BRASS

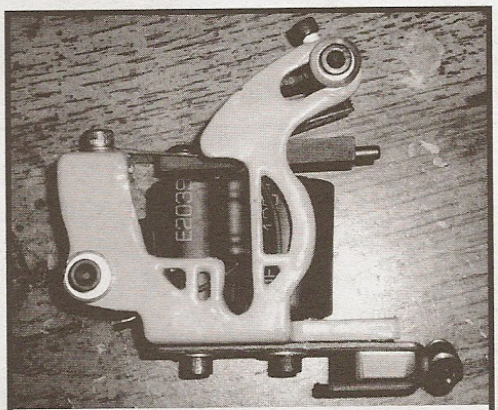
Bad Brass consists of two partners - Jason Haney and Ed Bell. Jason Haney has been tattooing for 14 years. Ed Bell has been tattooing since February, 1999 and comes from a machinist background.



MECHO MACHINE

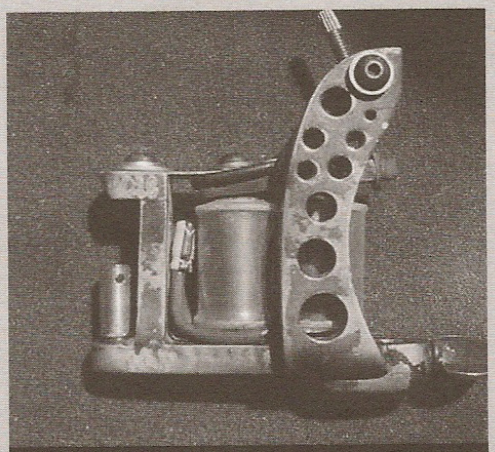


Jason Haney CUSTOM



S. Reed

Madera,
Pennsylvania, USA

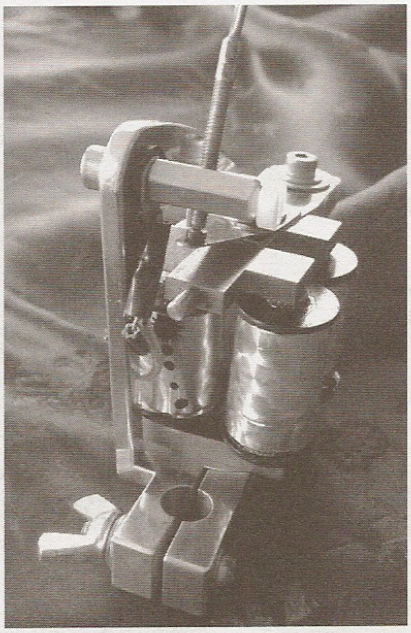


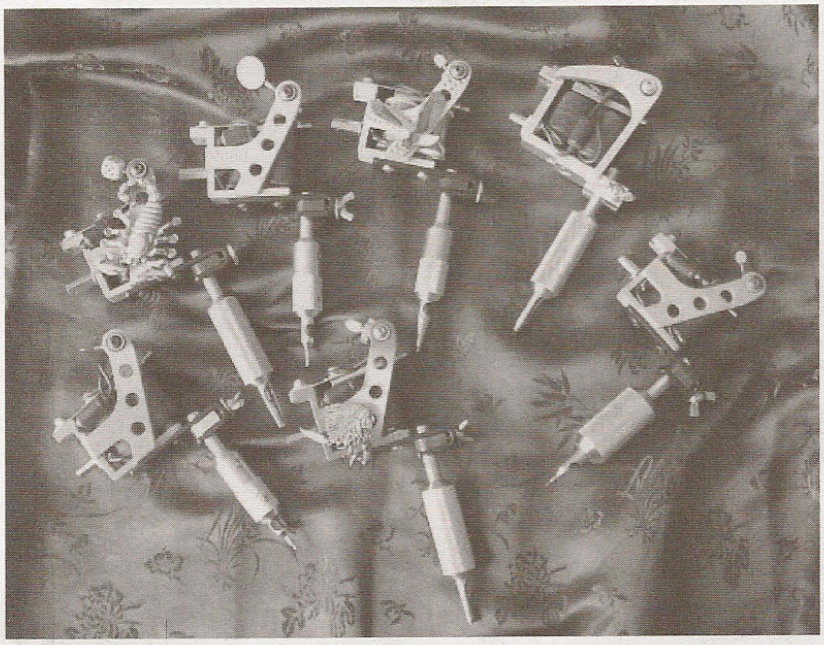
CROP CIRCLE

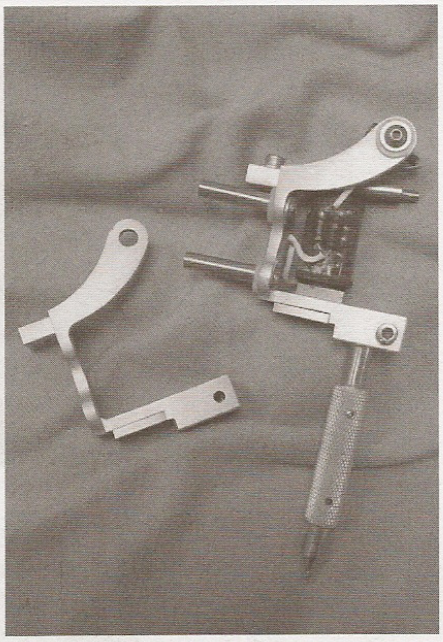
Jacky Beaugeois
France

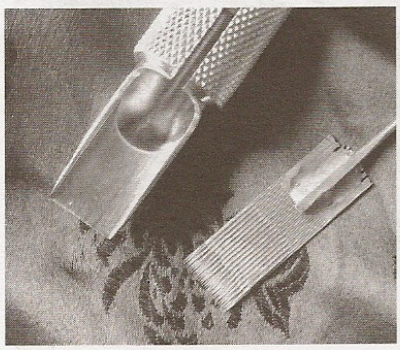
I wish to present you an artist with an interesting background of inventions and innovations in tattoo equipment. For 25 years, Jacky Beaugeois has built many tattoo machines, 4 coils, 3 coils and 1 coil which he still uses everyday to tattoo with. He claims to be the first to invent the open tube for 73 magnums, and magnum jigs that did not exist in the 1980's. Jacky is a very articulated craftsman and has a strong knowledge in metal works and casting.

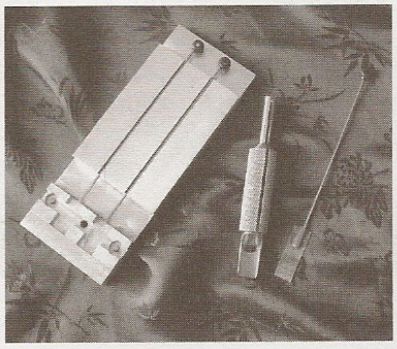
Thank you,
Clement Demers

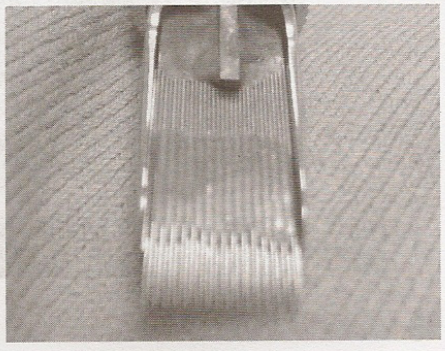


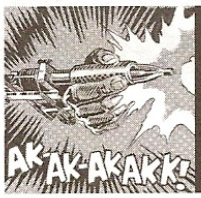






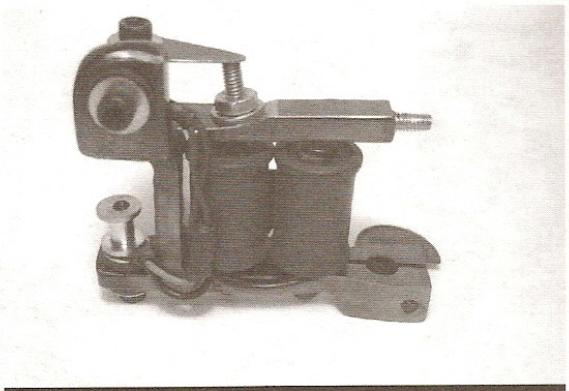




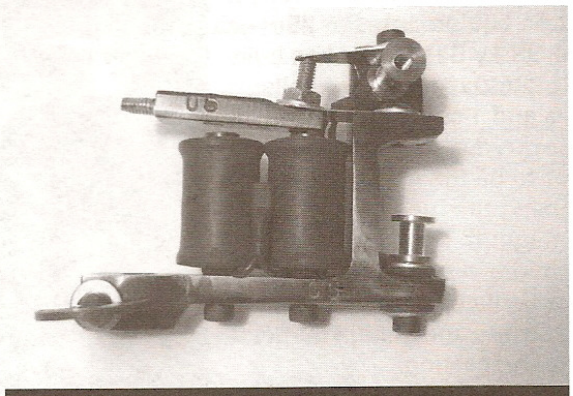


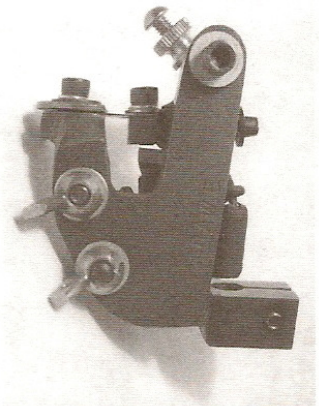
Brad Dawe

www.braddawe.com

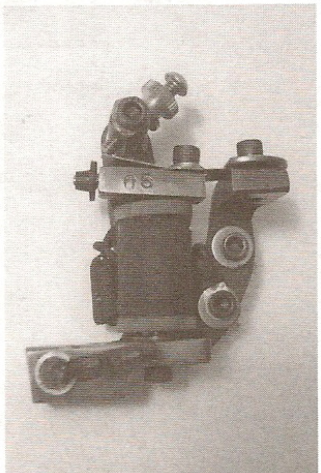


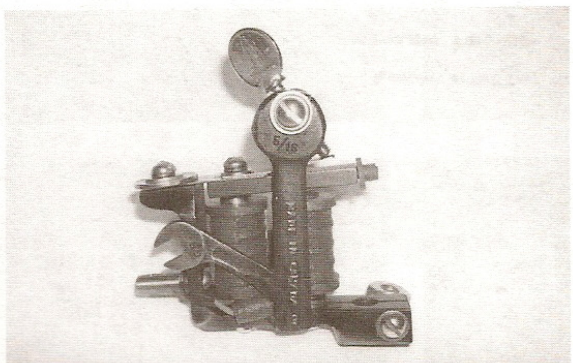
Experimental



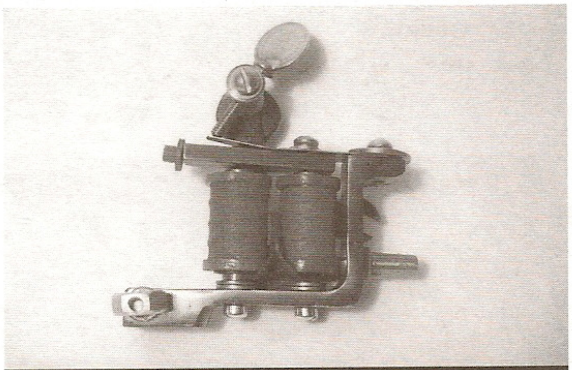


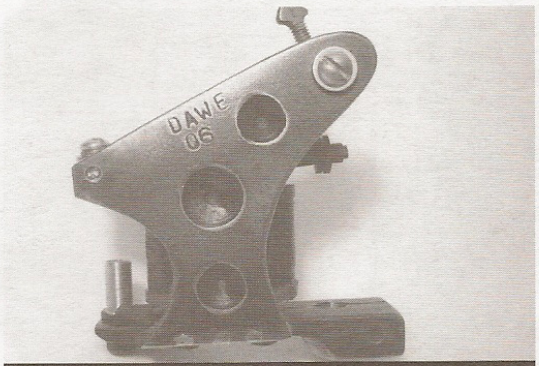
Single



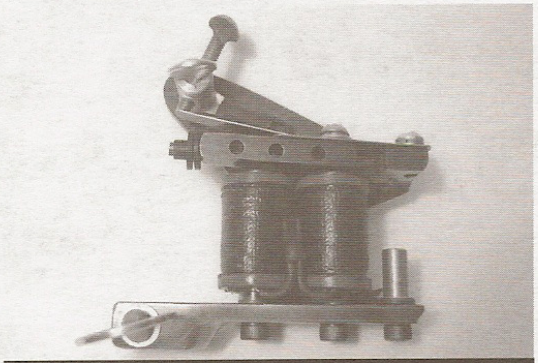


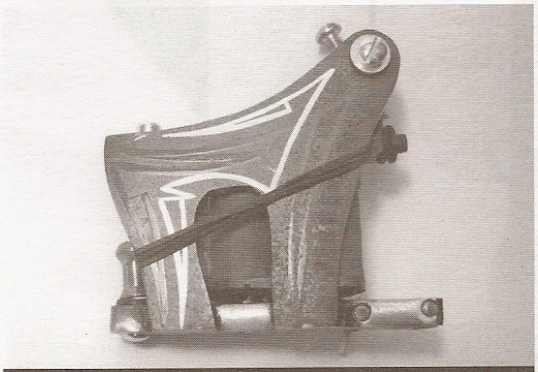
Jonesy Wrench



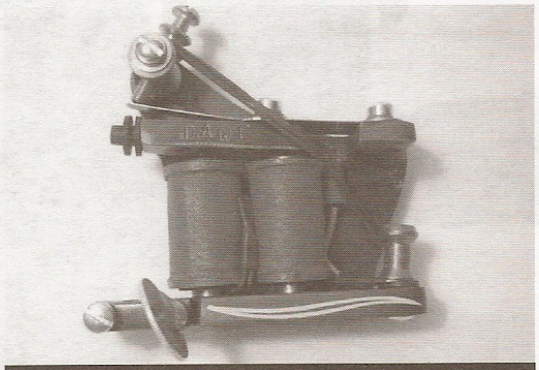


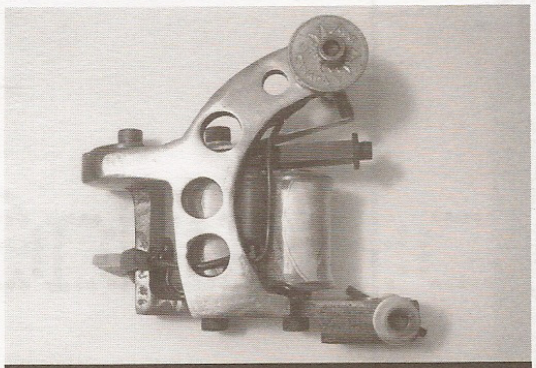
Handmade





Stripped Jensen



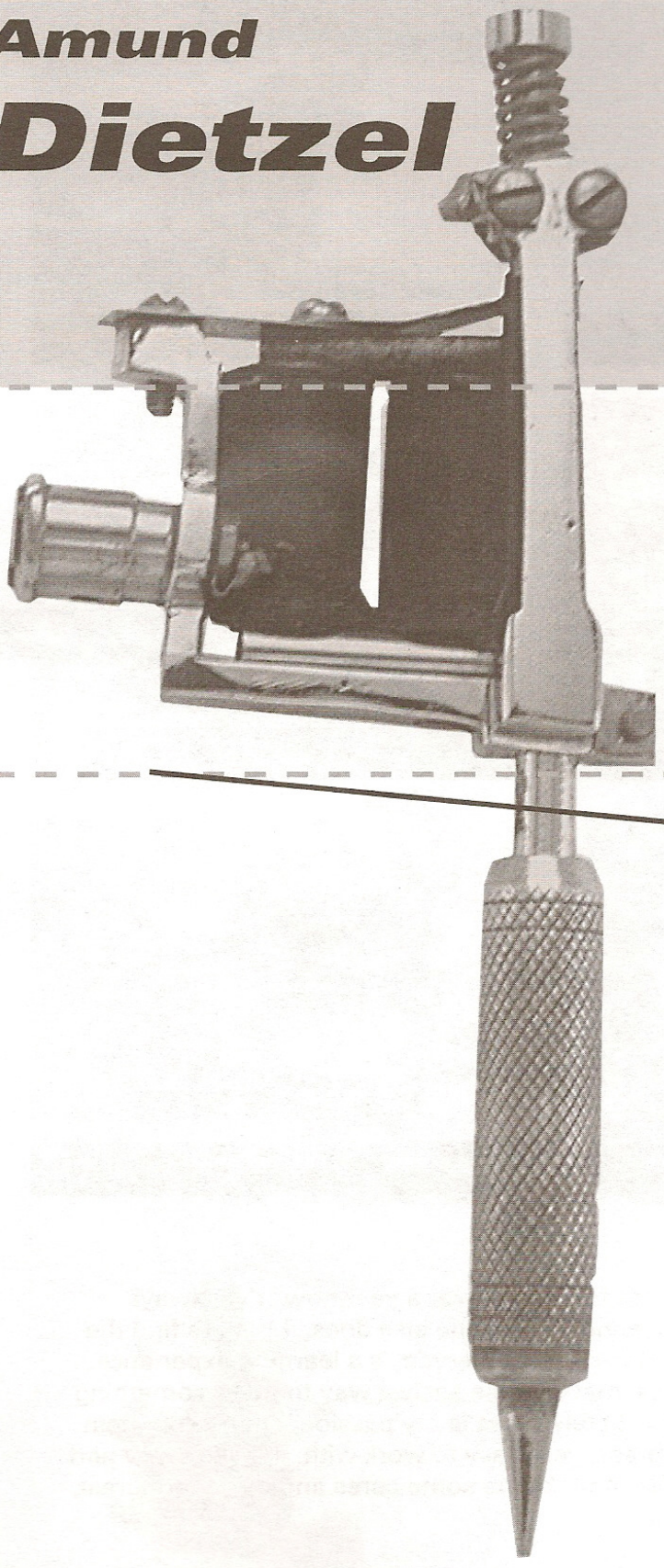


Soba Pilot Rebuild

I've been building true handmades for a little over a year now. I've always tinkered with machines, just like almost everyone else does. I tried to find the best way to make things do what I wanted. Everyday's a learning experience. I started off doing welded frames, that was the easiest way to make something without investing a lot of money. Lately brass is my passion, I'm having them casted and I like the feel of the brass, very easy to work with. I make every part by hand. Early on, I had Troy Glenn make me some cores and they were great, but I had to try that myself too.

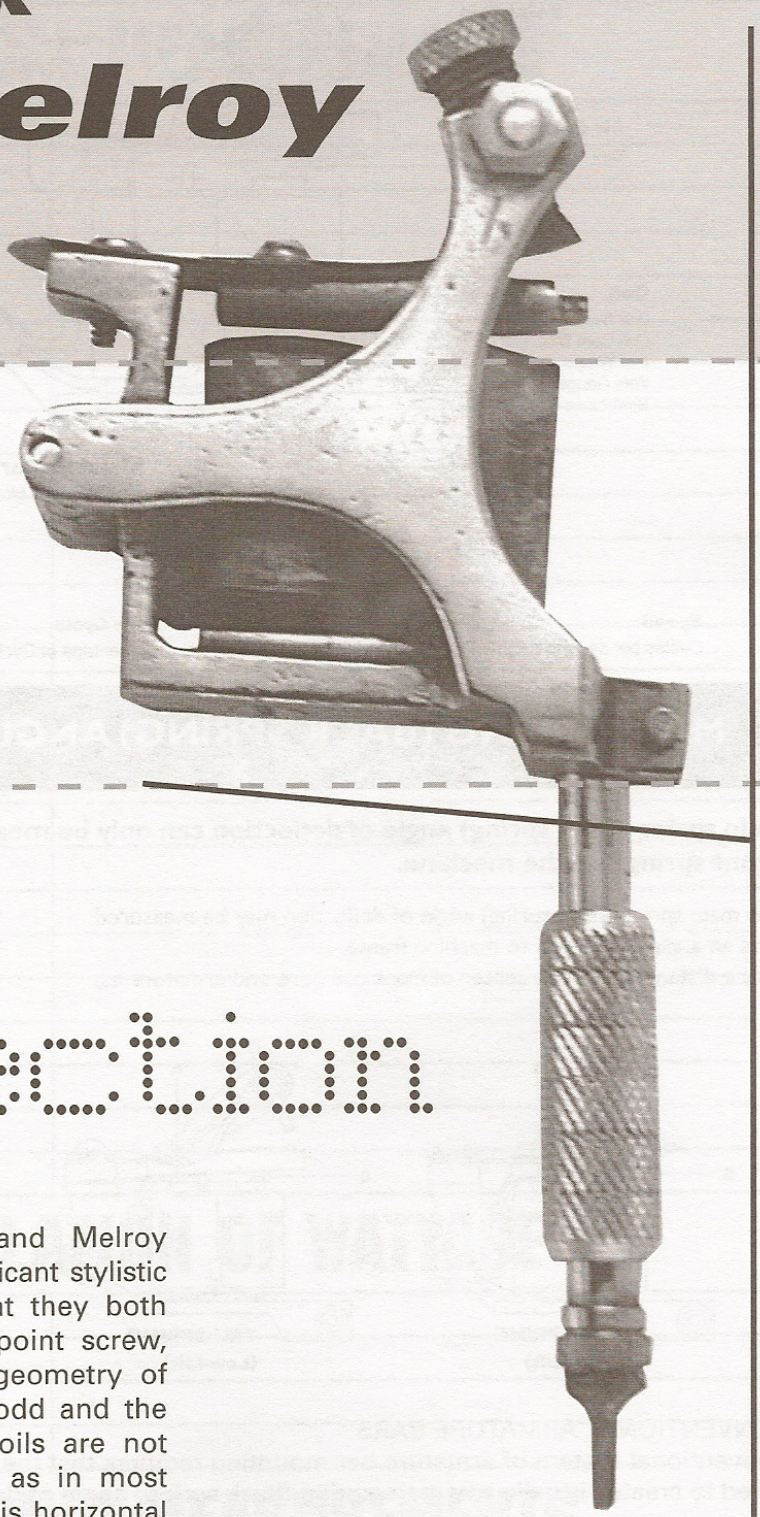
Brad Dawe

Amund Dietzel



The

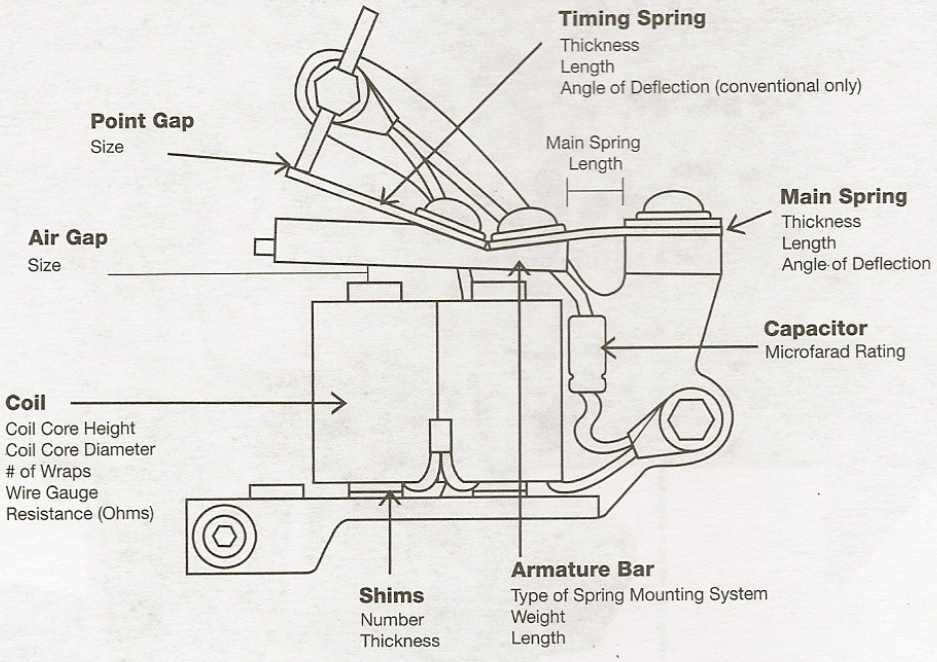
Nick Melroy



Connection

If you look at the Dietzel and Melroy frames, although there are significant stylistic differences beyond the fact that they both have a spring loaded contact point screw, there is one thing about the geometry of these two frames that is both odd and the same. The frame base and coils are not perpendicular to the tube vise as in most machines and the armature bar is horizontal when the machine is not running. It's never been proven that these two machines were built by the same person but there definitely is a connection between these two machine builders.

MACHINE MEASUREMENTS



Speed
Cycles per second (Hz)

Follow Through
Percentage of Cycles with Chatter

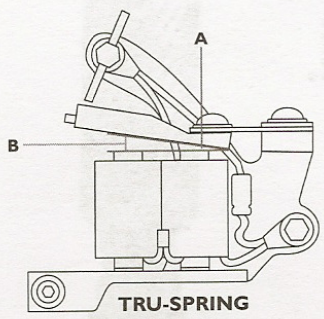
Duty Cycle
Percentage of Cycle with Closed Contact

Voltage
Power from Supply

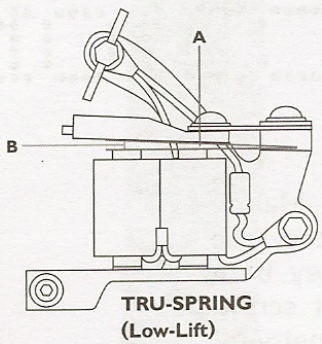
MAIN SPRING (BACK SPRING) ANGLE OF DEFLECTION

Main spring (back spring) angle of deflection can only be measured without a timing spring (front spring) on the machine.

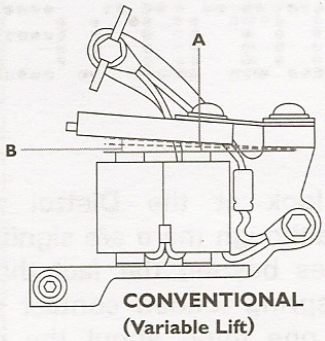
The main spring (back spring) angle of deflection may be measured:
A. as an angle in relation to machine frame
B. as a distance between center of front coil core and armature bar



TRU-SPRING (High-Lift)



TRU-SPRING (Low-Lift)



CONVENTIONAL (Variable Lift)

CONVENTIONAL ARMATURE BARS
Conventional system of armature bar mounting requires that the main spring (back spring) be bent or rolled to create virtually any main spring (back spring) angle of deflection.

TRU-SPRING ARMATURE BARS
Tru-Spring system of armature bar mounting ensures consistency in main spring (back spring) angle of deflection while utilizing flat springs.

Once the timing spring (front spring) is mounted on the armature bar, the measurement between the front coil core and the armature bar is referred to as the air gap.

TYPE OF SET-UP

	Liner:	Number of Needles:
	Shader:	Number of Needles:
	Coloring:	Number of Needles:

PHYSICAL MEASUREMENTS

	Timing Spring Thickness:	
	Timing Spring Length:	
	Timing Spring Angle of Deflection:	
	Main Spring Thickness:	
	Main Spring Length:	
	Main Spring Angle of Deflection:	
	Coil Core Height:	
	Coil Core Diameter:	
	Coil Length:	
	Number of Wraps on Coil:	
	Coil Wire Gauge:	
	Coil Resistance (OHMS):	
	Armature Bar Type:	
	Conventional:	
	Tru-Spring:	
	Armature Bar Weight:	
	Armature Bar Length:	
	Number of Shims (Front Coil):	
	Thickness of Shims (Front Coil):	
	Number of Shims (Back Coil):	
	Thickness of Shims (Back Coil):	
	Capacitor Size (uF):	

CALCULATION OF WATTAGE

	WATTS = VOLTS X AMPS:	
	VOLTS ÷ OHMS = AMPS:	
	Voltage:	
	Resistance of Coils (OHMS):	

ELECTRONIC MEASUREMENTS

	Speed:	
	Duty Cycle:	
	Follow Through:	
	Voltage:	

• FORCE
• STROKE LENGTH
• ARMATURE BAR WEIGHT

FORCE AND MACHINE SPEED ARE THE TWO VARIABLES OF MACHINE FUNCTION. EVERY MACHINE RUNS AT A CERTAIN SPEED AND MAKES A CERTAIN AMOUNT OF FORCE. UNDERSTANDING AND CONTROLLING FORCE ISN'T MUCH MORE COMPLICATED THAN SPEED, BUT IT'S STILL TRICKY.

DECIDING how much force you need is actually easy. Making that force is also pretty easy. Understanding all of the variables that are involved in the creation of force is complicated and for most tattoo artists, simply unnecessary.

Before this story gets any longer or confusing, let us tell you right up front, there is no way we can tell you exactly how much force your machine is making. But there are some easy steps that can be taken to approximately calculate and create the force you need for any specific type of tattooing, based on the size of and number of needles you're using.

Proper force means you are tattooing "in the skin", not working the armature bar to the front coil mechanically. The objective is to be utilizing the resistance of the needle configuration into the skin while still having the armature bar make a complete downward stroke to the front coil core. The closer you can get to having the resistance of the needle configuration in the skin determining the bottom end of the stroke length just as the armature bar makes contact with the front coil core - the better control you have and the more consistently the machine will run. The result would be that both machine operation, and your tattooing, will be smoother.

The faster that the armature bar moves downward, the more force it will create. If you increase armature bar speed, force will increase. If you decrease armature bar speed, force will decrease. For example if you have two machines, both running at the same speed; one machine with a short stroke length and the other with a long stroke length, the armature bar on the machine with the long stroke length has to move faster than the armature bar with the short stroke length in order to complete the same number of cycles per second. Therefore, if the two machines are running the same speed, the one with the longer stroke length will result in a faster moving armature bar, and consequently create more force.

If you want to increase force on a machine you must maintain the machine speed, and increase the stroke length. Machine speed should be maintained because required machine speed is determined by how each tattoo artist moves their hand while tattooing. Once machine speed is established and set, force can be controlled by increasing or decreasing stroke length.

Without getting into a serious scientific examination of dynamics, let's quickly go over the basics of what we generally refer to as machine force.

Velocity is the term that would decribe the speed that the armature bar is moving. If velocity is increasing, it is accelerating. If velocity is decreasing, it is decelerating.

When we say force, we mean impact. Impact of the needles against the surface of the skin. To increase impact, you need to increase momentum, which is accomplished by increasing velocity.

Whenever an object has momentum, it has kinetic energy, which is called the energy of motion. The kinetic energy of an object is measured as one half it's mass multiplied by it's velocity, squared. This energy is given up when one object strikes another, or is responsible for what is called impact. Basically, all that means to us is if you double the speed of the armature bar, you double the force squared. What that means is even a slight increase in armature bar speed, or velocity will make a great increase in force, or impact.

On impact, the armature bar velocity will decelerate. It is the friction of the needles going into the skin that will slow the armature bar down. The more needles you have in the configuration, the more resistance they will present. That is why the size and number of needles being used should determine the stroke length of a machine. The speed of the machine, the number of cycles per second is determined by what type of tattooing is being done, and will vary from tattoo artist to tattoo artist.

Understanding that, you will find that it requires some trial and error to get exactly the right stroke length to create the force you need, while maintaining machine speed. You're simply not going to get a machine set up perfectly with a little adjustment to stroke length.

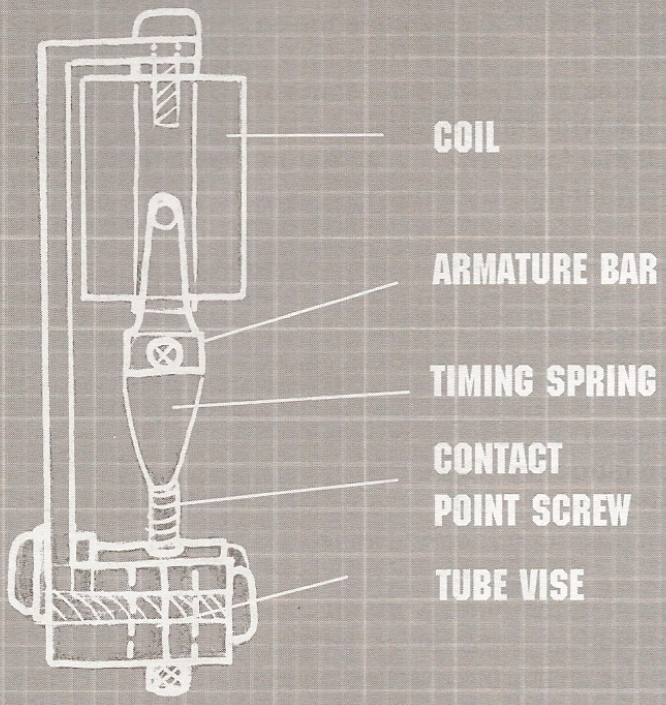
Any change to stroke length is going to affect speed. Generally, a longer stroke length requires that you use thicker springs to bring the machine speed back up, which in turn means an increase in required power. Many tattoo artists utilize a lighter armature bar instead of thicker springs to bring their machine speeds back up, often with less than satisfactory results. The speed may be right and the stroke length might be generating the right amount of force, but the machine runs erratically. When you use a light armature bar and thin springs in a long stroke set-up, there can be a sort of whipping action in the springs that can actually result in every third or fourth stroke being only half length as the timing spring begins to flex and unflex in a sequence that doesn't match the motion of the armature bar.

Light armature bars work best with short stroke set-ups. Heavier armature bars work best with longer stroke set-ups. As always, there is no substitute for experience. A lot of these things are just common sense. You need to have the machine speed that's right for how you tattoo, and you need to have force that corresponds to the needle configuration that you're using. **MGM**

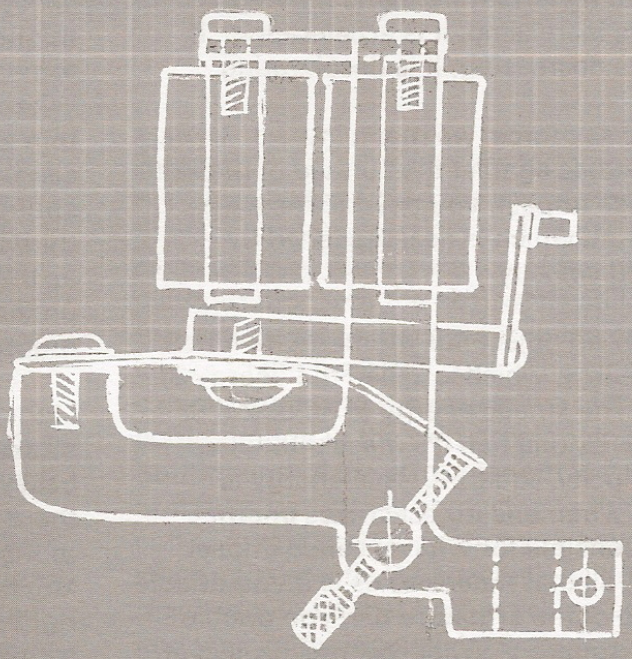
Design For Machine to Illustrate Force

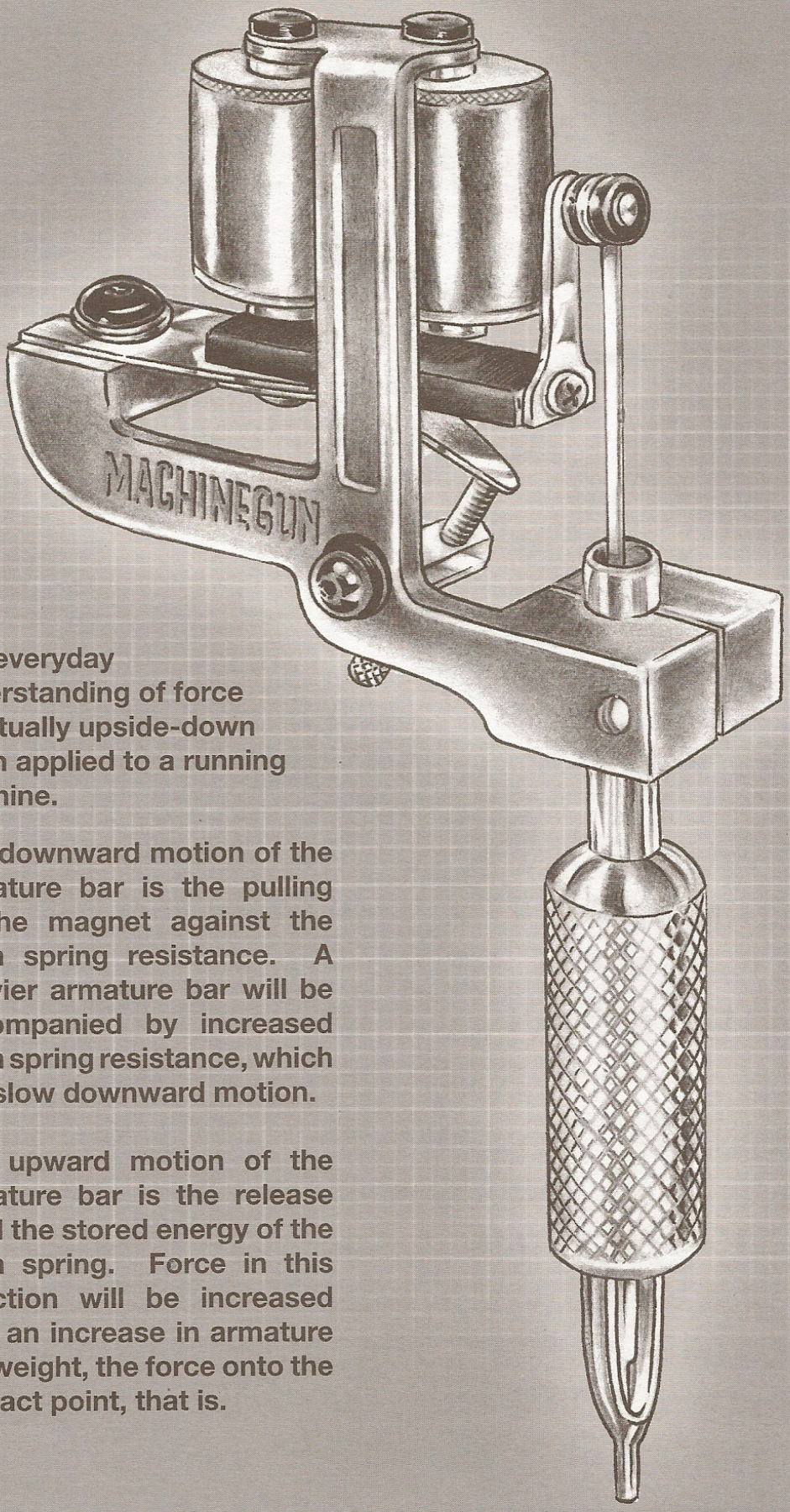
The force that a tattoo machine makes is commonly misunderstood. When we are tattooing we use the downward force of the machine. That force is generally believed to be the same as a hammer striking downward onto a nail, but the machine is running up and down.

FRONT VIEW



SIDE VIEW





Our everyday understanding of force is actually upside-down when applied to a running machine.

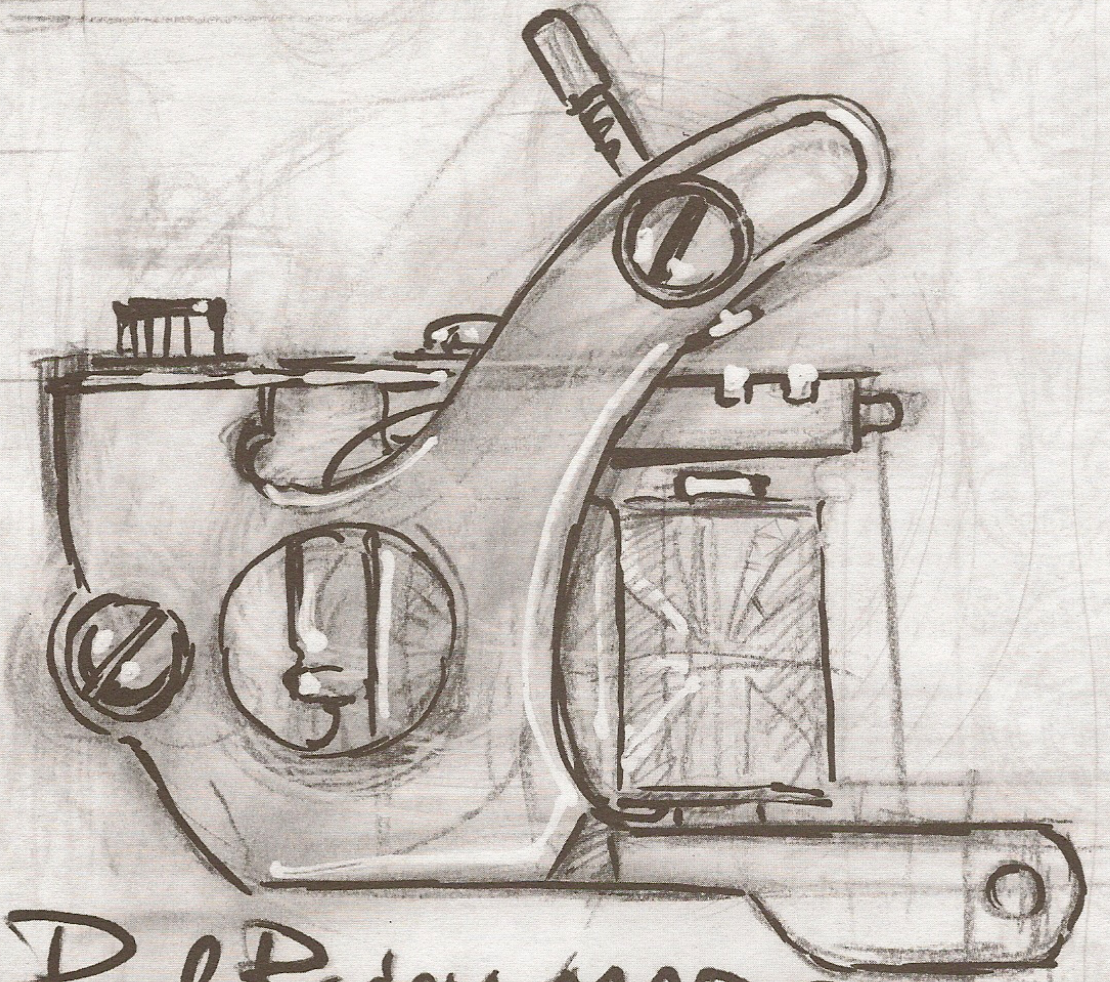
The downward motion of the armature bar is the pulling of the magnet against the main spring resistance. A heavier armature bar will be accompanied by increased main spring resistance, which will slow downward motion.

The upward motion of the armature bar is the release of all the stored energy of the main spring. Force in this direction will be increased with an increase in armature bar weight, the force onto the contact point, that is.

CUT-

ALTHOUGH A CUT-BACK IS OFTEN CALLED A FRAME STYLE, IT IS MORE ACCURATELY A FRAME MODIFICATION. CUT-BACKS WERE DESIGNED TO BE USED AS FAST-RUNNING LINER MACHINES-THE OPENING FOR THE TOP BINDING POST ON A SIDE-PLATE STYLE MACHINE FRAME IS "CUT-BACK". WHEN THE TOP BINDING POST AND CONTACT POINT SCREW ASSEMBLY ARE MOUNTED IN A CUT-BACK FRAME, THE CONTACT POINT IS CLOSER TO THE BACK OF THE MACHINE. A SHORTER TIMING SPRING IS USED, RESULTING IN A FASTER RUNNING MACHINE. BESIDES THE ALTERATION TO THE FRAME GEOMETRY, CUT-BACK LINERS OFTEN UTILIZED LIGHTENED ARMATURE BARS.

BACK MACHINE F'RAME



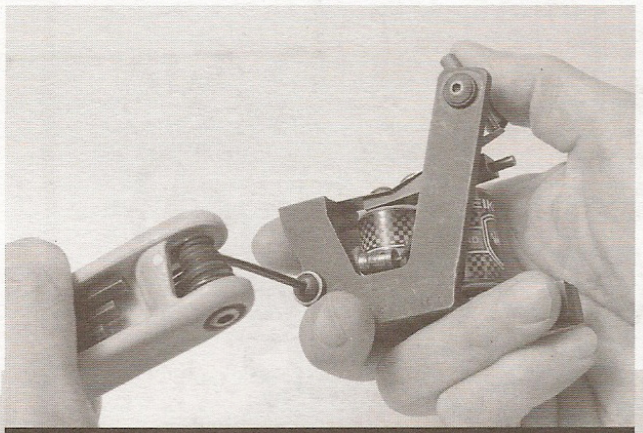
Paul Rogers MADBEE

ONE OF THE MOST IMPORTANT MACHINE BUILDERS OF ALL TIME... PAUL ROGERS BUILT CUT-BACK LINERS BY MODIFYING SPAULDING SUPREME FRAMES—

GIVE YOUR COILS THE LOOK YOU LIKE TO LOOK! AT

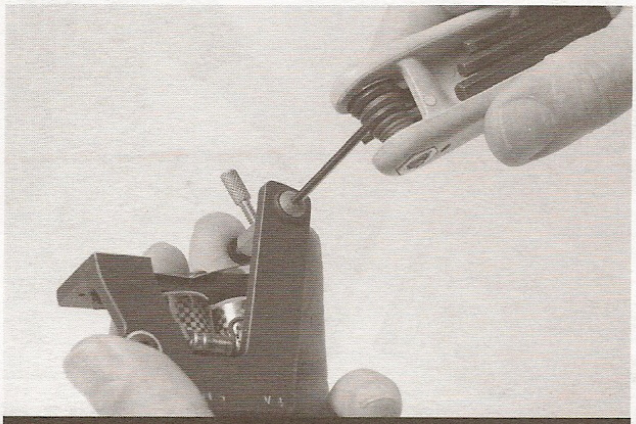
GET OUT THE SCISSORS!

In this modern age, there is no need to have plain looking coils on your machines. You can cut pictures out of magazines you have lying around, or download and print pictures you like off the internet. Once you've got a picture you like, at the size you need, it's as easy as cutting them out, applying them and heatshrinking them to your coils.

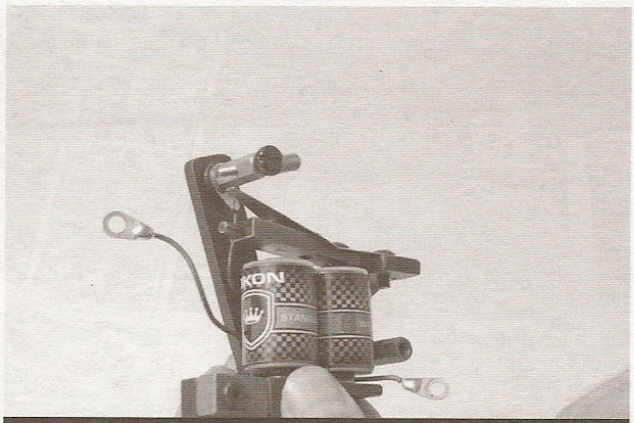


STEP - ONE
Remove back binding post mounting screw. Remove coil wire.

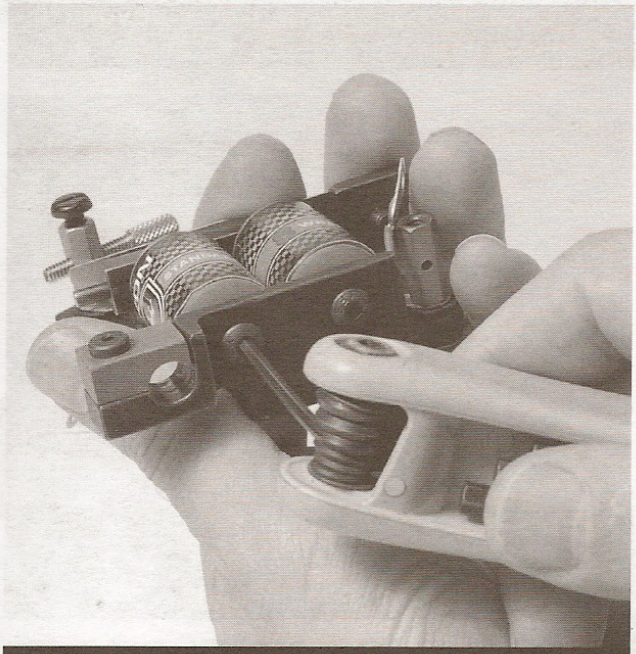
STEP - TWO
Reinstall all other wires and replace back binding post mounting screw.



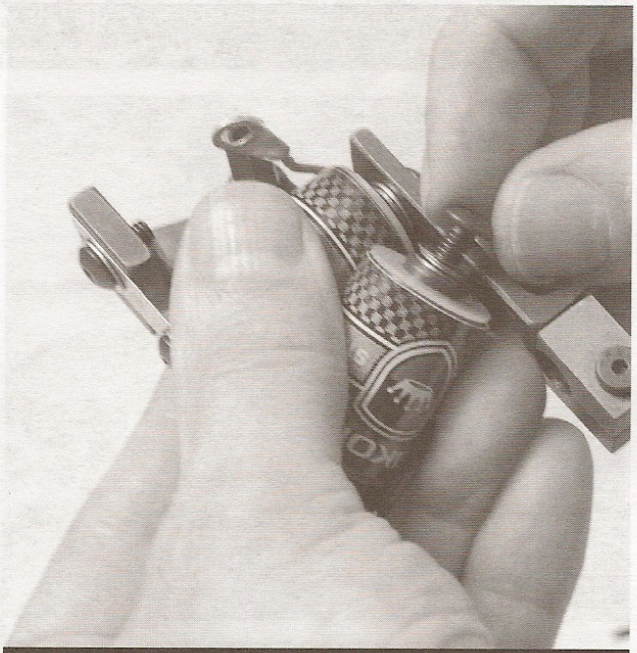
STEP - THREE
Remove top binding post mounting screw. Remove coil wire.



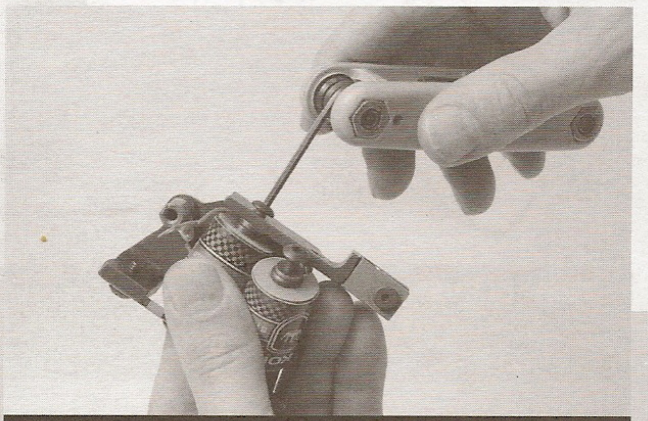
STEP - FOUR
Reinstall all other wires and replace top binding post mounting screw.



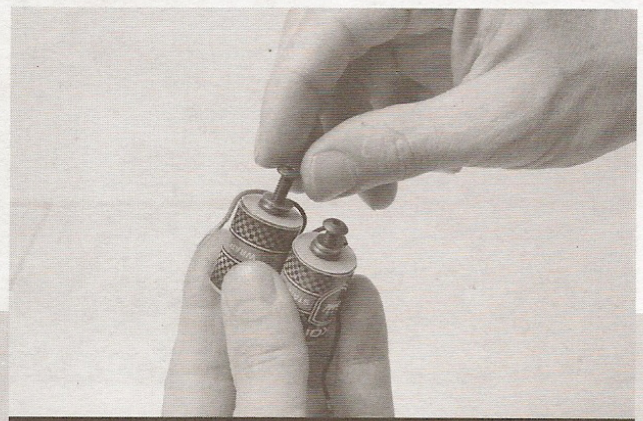
STEP - FIVE
Remove coils. Remove front coil mounting screw.



STEP - SIX
Put any shims and screw into coil.

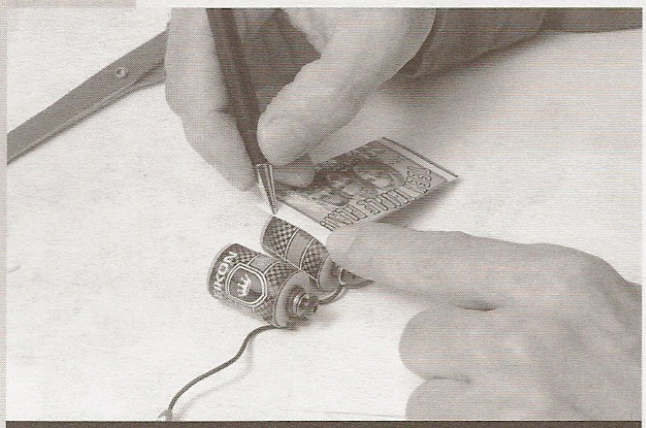


Do the same for the back coil.

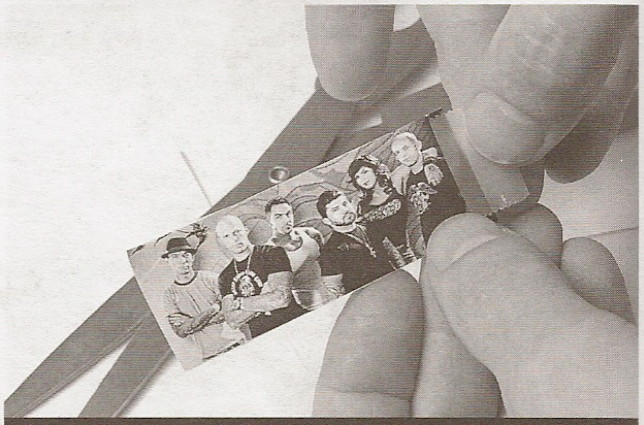


Put any shims and screw into back coil.

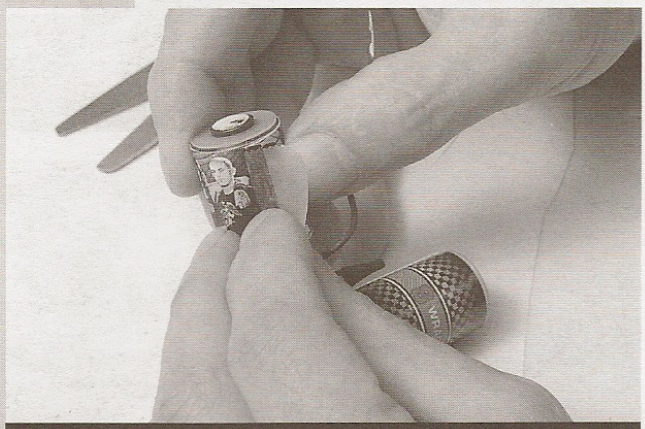
STEP - SEVEN
Choose photo, THIS IS THE HARDEST PART! If you can find one that's the right size for your coils just cut it out, if not, you may have to scan the photo and print it at the right size.



STEP - EIGHT
Mark size the picture needs to be.

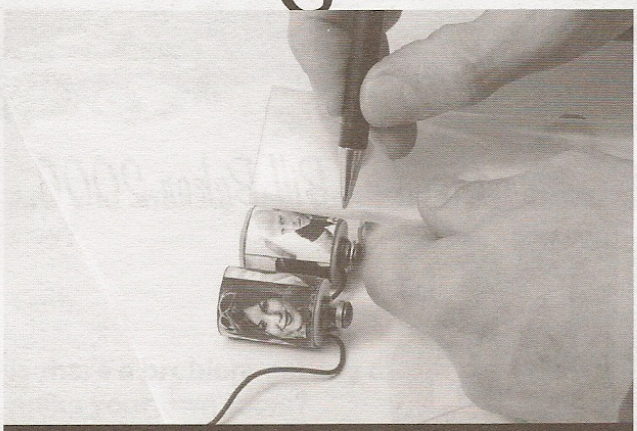


STEP - NINE
Cut out picture. Place a small piece of scotch tape on the end.

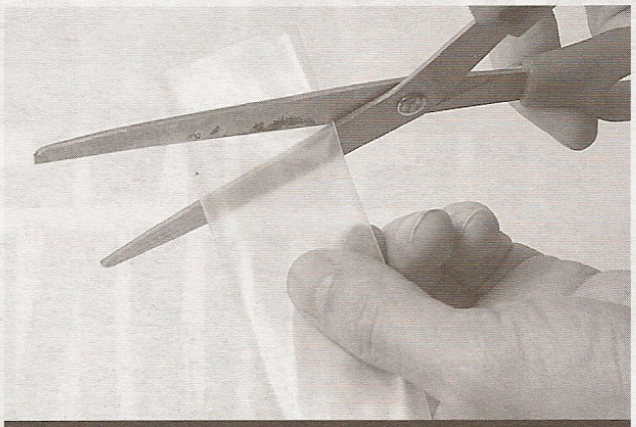


STEP - TEN
Fasten the picture around the coil with the piece of tape.

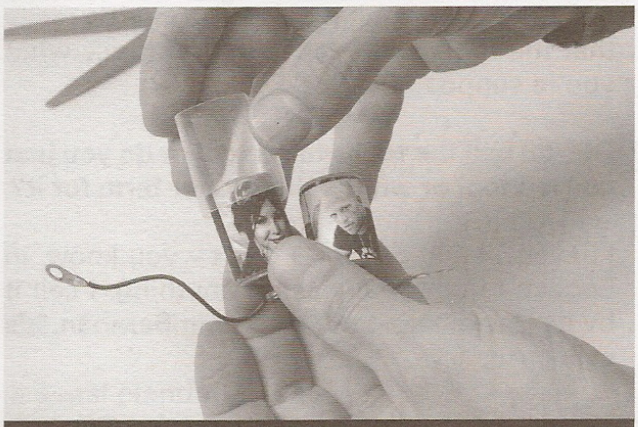
STEP - ELEVEN
Use clear heatshrink.



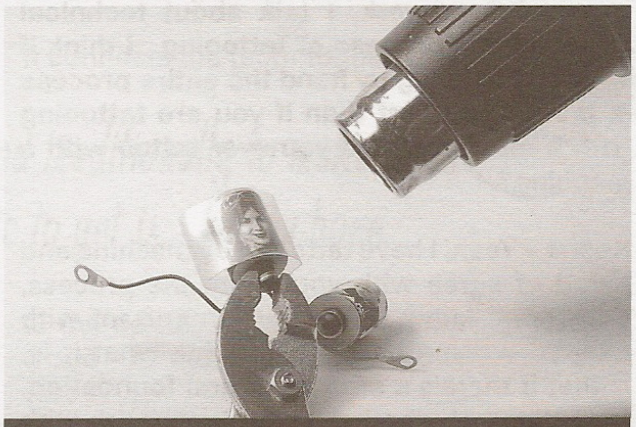
STEP - TWELVE
Mark size.



STEP - THIRTEEN
Cut heatshrink to fit coils.



STEP - FOURTEEN
Place heatshrink over coil.



STEP - FIFTEEN
Use a heat gun to fasten the heatshrink to the coils. Hold coil core with pliers - its HOT!

STEP - SIXTEEN
Reinstall coils into machine. What was once a plain looking machine is now TOTALLY AWESOME!

KEONE NUNES

interviewed by Bill Baker 2006...

Bill – You know, in the magazine I really don't talk about artwork, I talk about technical things or the process of tattooing. I think if you are tattooing by hand the entire process is more important than if you are tattooing with a machine. Did you ever tattoo with a machine?

Keone – Yeah, I have tattooed by machine and I kind of agree with you about the process, but I don't know if it's more important with people working by hand. I think what it is, is that if there's a strong cultural foundation, regardless of whether or not you work with hand tools or with electric tools, the process becomes more important.

I never really thought about that – it's true, really, that process matters in your approach to tattooing culturally, and that would dictate whether or not you use a machine, but when you're working by hand you're in charge of the whole process. Whereas I think that a lot of young tattooers just pick up a machine and go, and they don't think about what the machine is doing or the process in general, really.

I think that this might be a little controversial... and with no disrespect meant, but I think that if someone picks up a machine, given enough time, if you put time into learning how to use a machine, you'll become at least adequate in tattooing, with a machine. The machines are much more forgiving than hand tools. Hand tools are a little bit more difficult. I remember Paulo telling me that it's the tools that will choose you. Paulo Suluape taught me how to tap and he told me that 'I'd like to teach you, but I can only teach so much... and it's really that the tools will choose you, if that's what you're supposed to do!'

Do you call the tool a hand tool or do you just call it a tool or what's the proper term for it?

I never... I just call it... I don't – you know, in English I don't really call it anything. I call it by its Hawaiian name, Moli or in Samoan, it's called Au.

Is there a difference between the Samoan and the Hawaiian tools?

Out of all the Polynesian tools, the Samoan and the Hawaiian ones are more alike than Hawaiian tools were to any others. If you look at the tools from the Marquesas, the Maori tools, the Tahitian tools – all of those tools are very similar. But Hawaiian tools, as far as manufacturing-style, were very similar to Samoan tools. The Samoan tools that I've seen at the Bishop Museum were very finely made... the Hawaiian tools were actually finer. They have a Hawaiian tool at the Bishop made out of bird bone and it has in the space of about a little over half an inch, they had thirty-six teeth in it.

That part of the tool would be made out of bone and the groove in between each tooth would be cut or filed away to make the points. Do you tattoo now with that kind of tool?

Yeah.

Are you making the tools in a traditional way?

Yeah.

Is there a problem getting all the material to make your own tools?

Not really – the only material that was used traditionally to make tools that would be problematic to get is... and I've never used it, though I knew traditionally it was used, is human bone.

No. If there was anything within that, it was the lashing. The lashing really made a huge difference.

So the lashing is not purely decorative, but it can be done in an artistic manner, but the lashing must be there.

The lashing must be there.

Is the lashing on the handle? Like a wrap?

It connects the teeth to the handle.

the only material that was used traditionally to make tools that would be problematic to get is... human bone.

OK. That might be a little hard to get.

It's real plentiful.

Yeah, it's everywhere.

That's not the problem.

When you said the fineness of the tools, you were referring to the number and size of the teeth. Was the tool itself ornate or decorated, or was it really utilitarian? And today, do toolmakers do things that are purely stylistic?

Yes and no. Let me clarify that. The reason why I say that, is because every toolmaker has their signature that is within the tool itself. You can tell who made certain tools through their technique of manufacturing and through the fineness of the tools. It is basically utilitarian, we never put on a signature that would be a carved signature or something of that nature, we didn't do that.

No outright decoration just for the purpose of decorativeness?

Is the handle made out of a certain kind of wood – or can it be made out of any kind of wood?

Usually a wood called Ulei. That's because it has a flex in it already. It's a very hard wood, which withstands the tapping, but there's also a little bit of flex in it.

How big around is the handle?

There are no handles that have survived as archaeological evidence, but from the people that taught me about the Hawaiian stuff, the handles were about six inches long and about a little under a quarter inch at it's widest point.

About the size of a pencil.

Yeah, about that.

What part of the tree is it cut from – is it a single branch or is it carved from a block?

It was cut from a branch, so it was already round but you had to carve it somewhat. The handles on some tools connected at the end

to the teeth but some had an extension that went beyond the teeth.

Would you strike on the extension part of those tools?

You could hit it there. Not all tools were made that way.

The rod, or the striker what do you call that?

Hahau.

Is it bigger than the handle?

Yes.

Made of the same kind of wood?

No. Made up of a harder wood, either out of Kauila or Uhiuhi wood.

Is the striker wrapped, or lashed in any way?

Traditionally, I don't think it was lashed. The striker is made of a harder wood than the handle, so there's give in the handle of the Moli.

Do you use the same part of the striker always, or do you use different parts of it when you're working?

I do use different parts – but the majority of the time I use the same part.

Are you generally striking the tool with the same force, or do you vary that from time to time?

Usually you don't have to vary the force that you hit with, but depending on whether or not you're just doing lines or if you're filling in depending on how the skin is taking it. Depending if the person has a lot of hair follicles. Depending on whether or not you're hitting in an area that is really close to bone, you know all of those variables really determine what you can do, and how hard you hit and even the speed in which you hit.

The size of the tool, or of the teeth, does that determine or influence how hard you need to hit it?

If it's a wide tool then you have to hit harder. Although you hit harder, it doesn't necessarily feel like you're hitting harder because the energy is dissipated throughout the whole tool.

How fast do you move the tool along - do you pick the tool up, and then position it and then tap and then pick the tool up and move it and then tap... or do you do both motions at the same time?

It's not like you place it and then you tap and then you place it, but it's not necessarily you doing that all at once either. The technique is sort of in-between what you just said... but I couldn't categorize it as one or the other. You have to realize there is a cushion. I do use a pillow, traditionally pieces of Tapa, I can't say that for one hundred percent of the time because there are times where I will take it off the pillow and just use the handle laying straight on the person's skin. Usually my left hand actually rests on the pillow – so that creates a barrier between me and the person I'm tattooing.

Does it affect the striking of the tool?

Yes, there is some give. So with the give from the wood and the pillow itself, there is a lot of movement that happens, it also acts as a shock absorber in the sense that if the person moves, the pillow will absorb the movement enough so that I don't make a mistake.

When you're coloring – do you keep moving the tool all around to fill in areas solid?

It depends on the technique that the tattooist does. It does move all the time, but the way that the tattooist gets it to move varies according to the tattooist themselves.

Well, you know when we're coloring conventionally with a machine we're trying to fill in little areas and make it really solid by going, usually, in small circles, more or less. But when guys are coloring with hand work,

do they try to make it in lines or fill it in by crossing back and forth, or what?

Ultimately you're trying to fill in as much space as possible. I wouldn't say that you're actually tattooing the same way that you do with a machine.

No, I wouldn't think so, but it's not so much as making a line then moving down and making another line...

No, no, no... the reality is, I think I haven't really broken it down to every step of what I do.

I would think that how you go about making a line, or how you go about coloring an area would be kind of different from tattooer to tattooer and it's not like you have to tattoo a certain way because that's how Hawaiian tattooing has always been done.

Yes and no – there are certain elements that are fundamental.

Are they dictated culturally or is that sort of established? Like that's part of the process because that's how it's always been done?

No, it's more technical stuff.

Tattooists come and watch me tattoo and it looks relatively easy, I guess, and so I give them the tools and they totally bomb out.

Because it works the best?

Yes.

Tattooing with a machine has a history of about a hundred years, and we're still learning a lot and changing a lot, but the process you use for hand tattooing probably is virtually unchanged for more like one thousand years.

If you go to Samoan tradition, at least two thousand years. To me, there are three ways of doing traditional tattooing. The first is the long-handle way, which is how they tattoo in Thailand and I've heard in Thailand they do a style of hand-tapping as well. Japanese tattooing is also a long-handle way of tattooing. Then you have hand-picking which is, from what I understand more sort of like a Native American style for certain tribes. Europeans tattooed that way, too. And then you have a tapping technique which is found in the Philippines, in Micronesia and in areas of Polynesia. I don't know which of the three ways is the oldest, but probably hand-picking is older than anything else. Of the three techniques, I would say that the tapping is the youngest technique. I think that there's a natural evolution from hand-picking to long-handle, and doing the tapping is very, very different from doing the other two. But at the same time, if you look at traditions of Thailand, it seems to have been that the tapping technique is actually older than the long-stick.

A lot of my interest in Polynesian tattooing was that it had developed over such a long time, that there must be something about it that has become absolutely refined after a thousand or two thousand years. Really if you had that long to develop it, and alter it, and improve it... it must be getting to the point where it's as advanced as it could be... like the size of the tools and the length of the stick that's used as a striker, I mean everything must have been tried over two thousand years.

I think what wasn't tried was different variations on designs... because there was a fairly rigid sort of standard of designs. I've done some Kuaii style tattoos which is very similar to Marquesian stuff, heavy black designs and such and I'll be honest with you, it's way faster than a machine.

Yeah. Because it's the right tool for that design. That is something I didn't really think of, that maybe the tool has developed over two thousand years – but I was so busy

thinking how perfectly refined the tool must have become, that I didn't even consider that it's really only refined for doing that style of design.

Right. For anything that is geometric including round and curvilinear designs. For pictures, it's different. The tools would probably not do very well for pictures. I've not tried it, nor do I have any inclinations to try and do that! But tools do extremely well for Polynesian design. One of the things that is really different between western tattooing and a tapping style of tattooing is that my dominant hand does not draw the picture.

Is the dominant hand the striking hand?

machine, I could daydream, I could get lost in the design of the tattoo and not really worry about the technical stuff or whatever. I can't do that with traditional tools. Traditional tools require your one hundred percent concentration. If you lose focus, then you will make a mistake. You have to really, really get focused. I enjoy tattooing with traditional tools – that's the only way I do work right now, but I'm so much more tired after working now than when I tattooed with a machine.

When you're tattooing, you've got your point of view and the client has their point of view and there's a sort of interaction in the process that can be stressful and tiring. But with the machine, it's like the machine has it's own process...

Within the western tattoo tradition, you get paid to work – I don't really work in that way.

Right. So the finesse of it is on your non-dominant hand. All the intricate designs and all of that kind of stuff is collaboration with both your left and right side of your body, which is kind of difficult.

Well, yeah... but it would put you in a space where you probably have to be more aware of the whole process at once, using both hands.

Exactly, and if you're not balanced within yourself, then you can't do it. A lot of times tattooists come and watch me tattoo and it looks relatively easy, I guess, and so I give them the tools and they totally bomb out. The hardest thing to do is make a straight line – the easiest thing to do is to fill... and they can't even do fill properly.

I suppose it would look easy if it's being done right, but it sounds to me like there's a lot of things to do all at once.

Again, no disrespect to machine tattooists. But I think when I was tattooing with a

There's an intermediary between your hand and the skin. When I'm tapping, although I don't touch the skin at all, I can tell whether a person is holding their breath, I can tell whether or not the person has had some health problems and I can tell whether or not they're tensing up... not by watching them but by how the tools feel when it's tapping onto the skin. A lot of people are surprised when I say 'stop holding your breath' and they'll say 'how do you know I'm holding my breath?' And I tell them I can feel it. Some people think it's something strange – it's not strange, once you start getting in tune with how to tap, you need to pay attention to those things.

It's part of the process. Do you have someone stretching the skin for you when you work?

Yes. I have one person always. If there are two people I utilize them, but mostly just one.

So there's two people, the tattooist and the person stretching. How much does the stretching affect the tattooing? Does the

person who stretches need to be part of the process, like can they stretch too much, or too little?

The people who stretch are apprentices.

How long would an apprentice stretch before they would start to tattoo?

About two or three years.

I guess that would depend on who they're working with and how much he is tattooing.

Right, sometimes I'll be tattooing ten days straight, but mostly I'm tattooing three days a week.

Do you tattoo people the first time you meet them?

Usually I don't. The only time that happens is at Conventions. Even at Conventions I'll spend the time and talk to people about why they want to get tattooed. I want to know why people are interested in getting a hand-tattoo. I do it because it will give me more clarity as to whether or not I'm the right person to do it. I've got no problem telling people 'You know, I might not be the right person to do your tattoo, why don't you go talk to somebody else?' I've got no problem doing that because as far as that's concerned... I don't want to say that I don't have any ego in it, but in a sense I don't. I think that it's more important for someone to get the right person to work on them in the right way.

It's not as if you're saying they're not the right customer, it's just not the right connection between you and that person – it's not right or wrong.

Sometimes people really don't understand that because within the western tattoo tradition, you get paid to work – I don't really work in that way. You know, I talk to a lot of tattoo artists, some very famous ones from Europe and America, and the good ones, the really good ones are very process oriented – so I don't think it's impossible to do this in western tattooing.

I think a lot of guys who tattoo with machines don't even imagine they could do a better job of the entire process because it's not required and you can get away without it. I believe one part of it is understanding your tools, and to me that means if you use a machine you've got to know what it's doing, you shouldn't just be holding onto it and letting it do the work – you've got to be in charge of it.

Right. There's really so much within the process. One other thing that I do, that I know no other tattooist does is I keep all the things that I use on the individual – even the plastic that's used to cover the bottles and stuff like that, that are used and definitely all of the tissue and all that, and I give it back to the person at the end of the tattoo. The reason that I do this is that historically tattooists in Polynesia were very special people. They were the only people that could draw blood from a high-ranking individual without getting killed. That, in essence, showed the tremendous mana of the tattooist. With that being said, the blood of a person of chiefly rank, in fact the blood of anybody, was sacred. And now we have understanding that the blood shows our DNA – it contains who we are. So, I understood that when I started tattooing. My Auntie has taught me so much about the tattooing, she had helped her uncle, who was probably the last tattooist with traditional tools in Hawaii. The last tattoo that he did was between 1900 and 1915, to a person who died in 1969, at the age of seventy-some odd years old. My Auntie told me that what they did was burn all the things, the Tapa and all of those things, because they were sacred. Because of that, it's always been difficult for me to throw everything into a waste basket and treat it as a biohazard. It's up to the individual who has been tattooed to take care of those things in whatever way they feel is appropriate. **MGM**

POPULAR
RELAYER
ALL THE RELAY NEWS... REALLY

★★★★★
FEATURE

EIKON, September, 2006. vol. 1,
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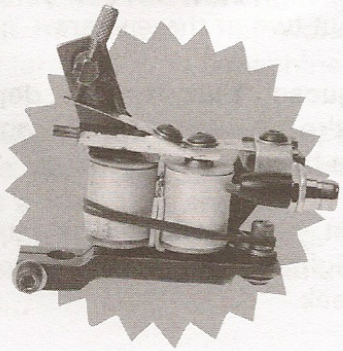
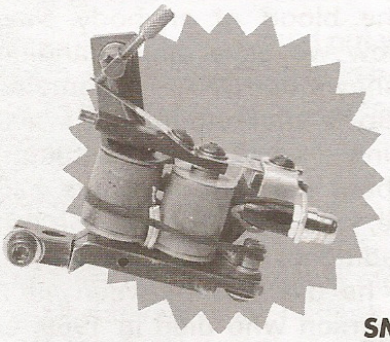
BILL BAKER FINALLY RETIRES...

SHADER MACHINE -
USED FOR SHADING



4 IMPORTANT MACHINES!

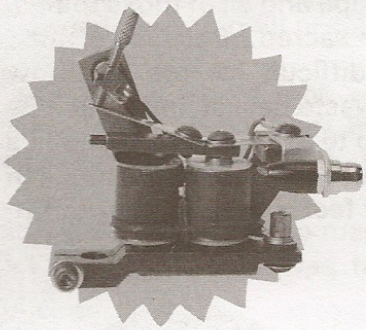
COLORING MACHINE -
USED FOR COLORING

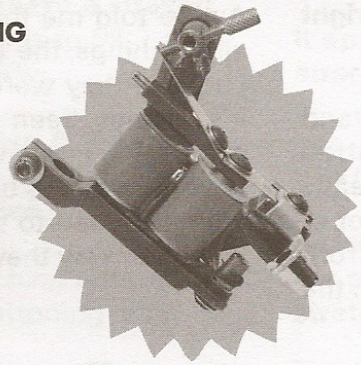


"I'M EXCITED"

SMALL LINING MACHINE -
USED FOR SOME OUTLINING

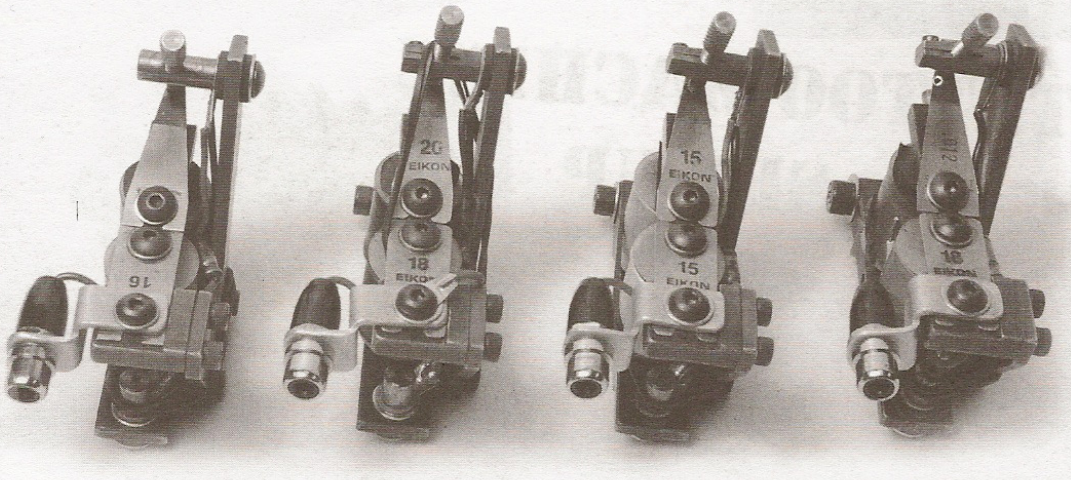
BIG LINER MACHINE -
USED FOR OTHER OUTLINING





STATES TIRED - LOOKING EIKON ICON

For most tattoo artists, machines come and go. A machine might be in your rotation for a number of years and eventually, a new machine will put an old one out to pasture.



This is how the machines would have looked to Baker when he was using them.

Before Eikon, I mostly used the same machines for over a decade. I had got them working pretty good, so I didn't do too much with them and I never bought new machines because I couldn't imagine that they'd improve my life in any way.

I know a lot more about machines now than I used to, but still, if I have an idea for a part or a way of setting up a machine, I'll actually use my everyday machines.

The machines that I've got now I have been tattooing with and testing things on since 2002. Ben Campbell built them for me when he was just a kid down in the Eikon shop and the idea was to get four frames that were exactly the same. So the changes or differences from one machine to the other would only be parts or adjustments.

Finally, I got to the point where I couldn't test any new parts or ideas on these frames without taking off some of the hand-made parts that were prototyped and tested on them. In a way, I'll miss them. I'm still always worried that maybe a new machine won't run quite as good as the one I've got, but I'm excited about some new ways of setting-up a machine that we've been working on, and hopefully I'll be able to do lots of tattooing with them. It's always a little bit like the closing of a chapter when I retire a machine… it's not just the machine, it's all the time spent tattooing and all the time spent with those customers.

As the years have gone by, we've collected more and more stuff at Eikon. Now, we have an archive room that doubles as a library and meeting room. We've got all the stuff in there… the real green monster machine that ran over 300 Hz. All the machines that anyone ever gave me are in there, along with a lot of coloring contest entries and most of the original flash from Tat-A-Rama. Lots of unicorns and Tazmanian devils. There's actually a bunch of Tat-A-Rama stuff, that was the shop that Dean and I built in the 80's, but these four machines definitely have an important place in Eikon history. They have more prototyped parts on them than any others we've got – I think mostly because we've been too busy to make new frames… so we just kept piling parts onto these. **MGM**

TATTOO MACHINE SET-UP

Basics

To get the right set-up for any machine, you need to set the force and the speed. The right force of the machine is determined by how many needles are in the configuration you'll be using in that machine. The right speed of the machine is determined by what kind of tattooing the machine will be used for; outlining, shading or solid coloring.

Tools you'll need to adjust your machine:

- Full display meter – Eikon EMS 200
- Hex-Key set or screwdriver to change the springs on your machine
- Springs in various thicknesses
- A nickel
- A dime

STEP 1 – ADJUSTING FORCE

Make sure the machine will make the force that you need. Force is controlled by the stroke length of the machine.

To increase force: Increase the stroke length of the machine by increasing the size of the air gap.

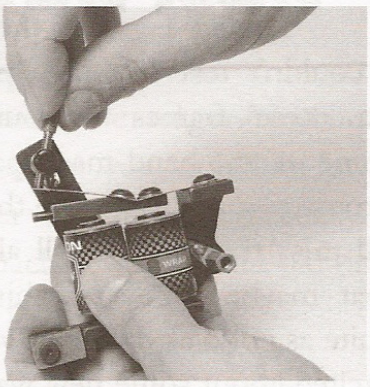
a. Loosen contact point set screw.
b. Turn contact point screw counter-clockwise. Do this while the machine is not running.
c. Once air gap is adjusted to the size you want, tighten contact point set screw.

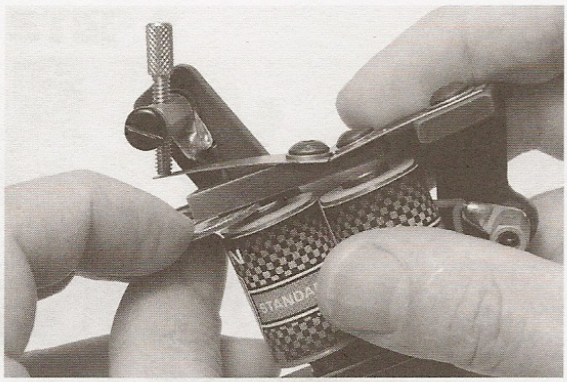
To decrease force: Decrease the stroke length of the machine by decreasing the size of the air gap.

a. Loosen contact point set screw.
b. Turn contact point screw clockwise. Do this while the machine is not running.
c. Once air gap is adjusted to the size you want, tighten contact point set screw.

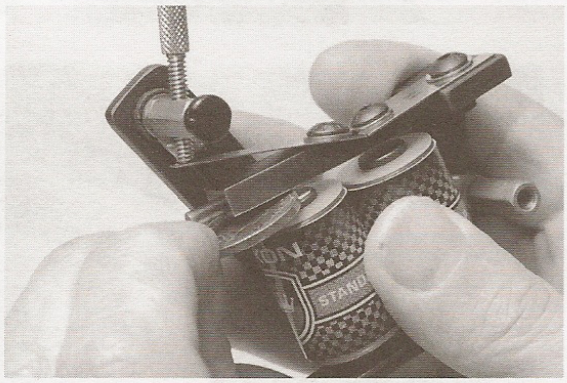
a

b





FOR THREE NEEDLES:
Set air gap to approximately the size of a dime



FOR SEVEN NEEDLES:
Set air gap to approximately the size of a nickel

Once the stroke length of the machine is set, run machine and check speed, not duty cycle.

STEP 2 – ADJUSTING SPEED

Make sure the machine will run at the speed you need. Speed is controlled by the timing (front) spring on the machine.

To increase speed: Put a thicker timing spring on the machine.

d. Loosen screw on the top of the armature bar that holds the timing spring in place. Remove timing spring from machine.
e. Install a thicker timing spring onto machine.
f. Make sure armature bar is in correct, original position. Tighten timing spring mounting screw.

To decrease speed: Put a thinner timing spring on the machine.

d. Loosen screw on the top of the armature bar that holds the timing spring in place. Remove timing spring from machine.
e. Install a thinner timing spring onto machine.
f. Make sure armature bar is in correct, original position. Tighten timing spring mounting screw.

Machine speed depends on usage. Suggested machine speeds are expressed as averages with needle bar and tube installed. Each tattooer will find an exact speed that will suit how they tattoo.

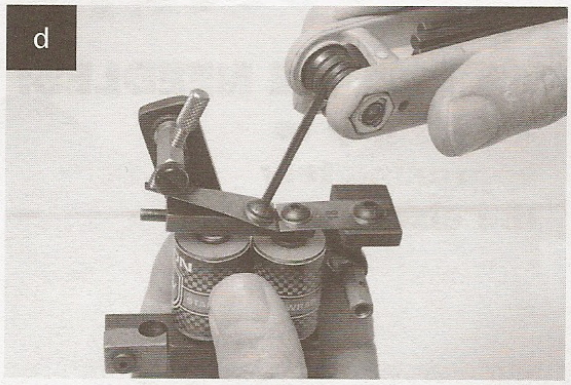
For Outlining
Machine speed is generally between 120Hz and 140Hz.

For Shading
Machine speed is generally between 110Hz and 120Hz.

For Solid Coloring
Machine speed is generally between 100Hz and 110Hz.

STEP 2

d



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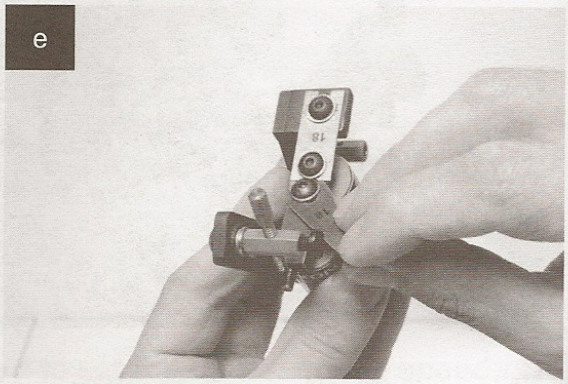

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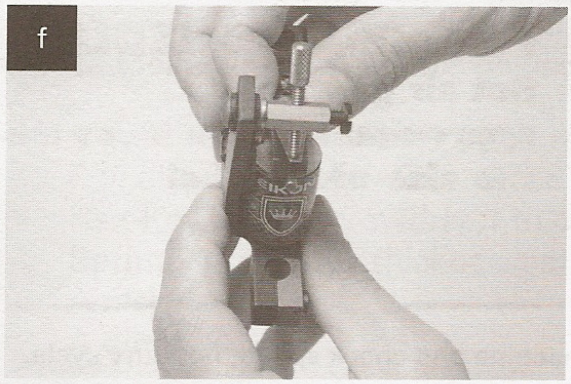

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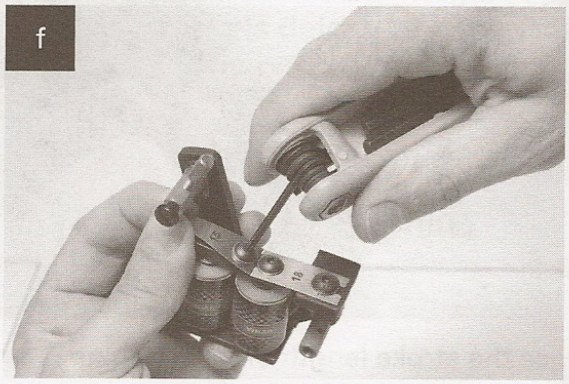


Once you have the right timing spring installed onto machine, check the size of the stroke length. Adjust stroke length, if necessary. Run machine and check speed, not duty cycle.

STEP 3 – FINE TUNING ADJUSTMENTS

There are two fine-tuning adjustments; rubber band tension, and point gap/air gap balance.

Rubber band tension: Make sure the rubber bands on the machine are pulling back evenly on the needle bar.

To adjust rubber band tension:

g. Make sure that the rubber band tension is adequate but not excessive.

Point gap/air gap balance: The balance between the point gap and air gap is not one of size. It is one of timing, or duration.

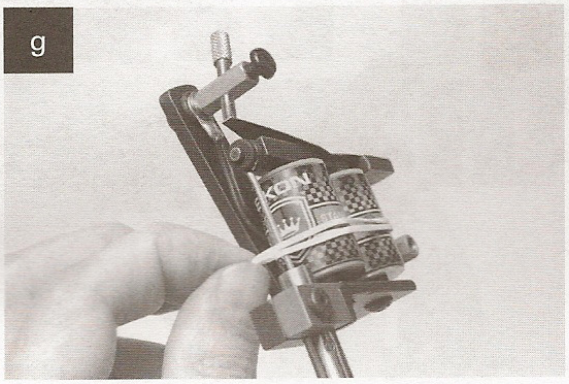
To adjust point gap/air gap balance:

h. Loosen contact point set screw.
j. While machine is running, turn contact point screw clockwise and counter-clockwise, until machine runs smoothly. Adjust power output of power supply if necessary.
k. Tighten contact point set screw.

- Fine tuning adjustments should not change machine speed enough to change the function of the machine.
- If fine tuning adjustments cannot make the machine run smoothly, then the main (back) spring on the machine may need to be replaced with a thinner or thicker main spring.
- Check stroke length, adjust if necessary.
- Run machine and check speed and duty cycle. Duty cycle for any machine should be between 45% and 50%.

STEP 3

g



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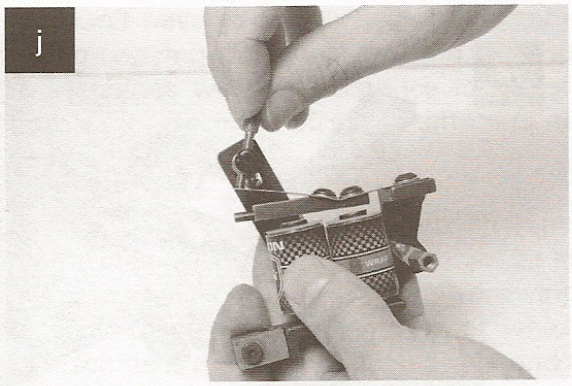


k

STEP 4 – ADJUSTING DUTY CYCLE

Make sure the machine will run at a proper duty cycle. Duty cycle is controlled by the main (back) spring on the machine.

To increase duty cycle: Put a thicker main spring on the machine.

l. Loosen the main spring mounting screw. Remove the main spring from the machine. Remove the armature bar from the main spring.

m. Attach a thicker main spring to the armature bar. Install main spring and armature bar onto machine.

n. Make sure armature bar is in correct, original position. Tighten main spring mounting screw.

To decrease duty cycle: Put a thinner main spring on the machine.

l. Loosen the main spring mounting screw. Remove the main spring from the machine. Remove the armature bar from the main spring.

m. Attach a thinner main spring to the armature bar. Install main spring and armature bar onto machine.

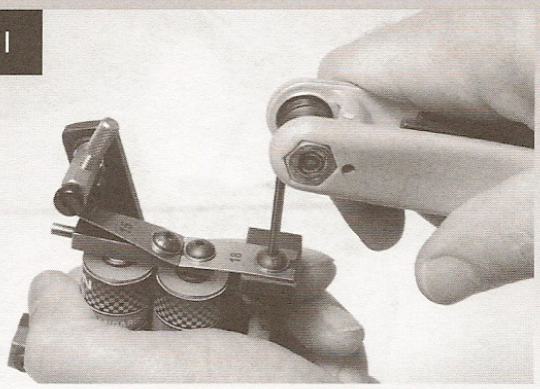
n. Make sure armature bar is in correct, original position. Tighten main spring mounting screw.

continued on next page →

MACHINE SET UP BASICS

STEP 4

l



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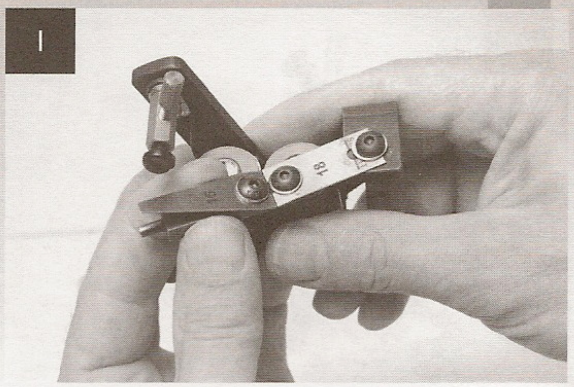

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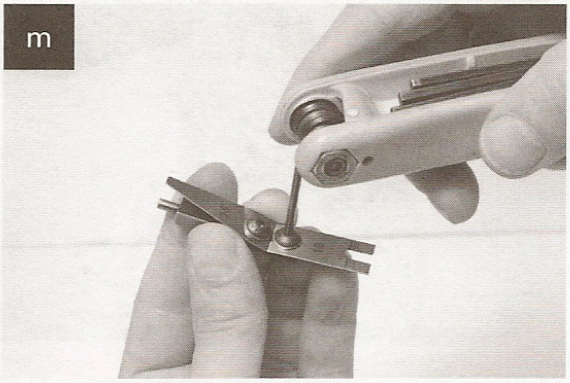

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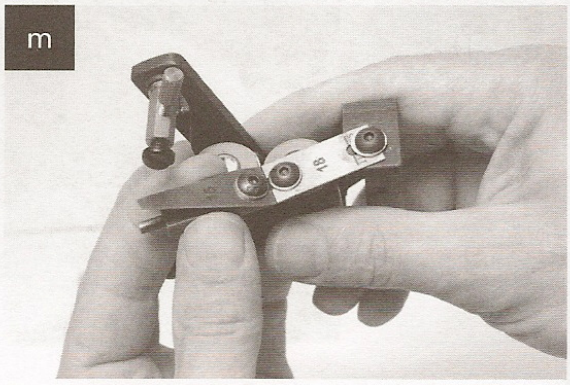

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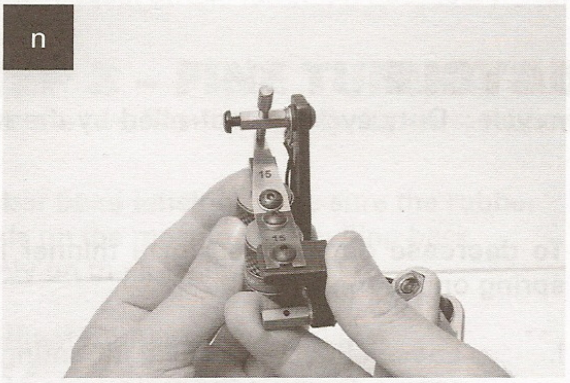

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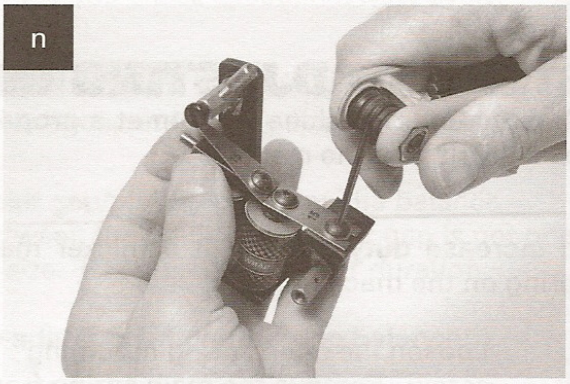


- If using a conventional system of main spring mounting, make sure that main spring angle of deflection is adequate. Tru-spring system of main spring mounting ensures consistency in main spring angle of deflection and eliminates all spring bending.
- Once you have the right main spring installed onto machine, check the size of the stroke length. Adjust stroke length, if necessary. Run machine and check speed and duty cycle.
- You may have to go through all these steps two or more times, as machine gets closer to proper set-up.

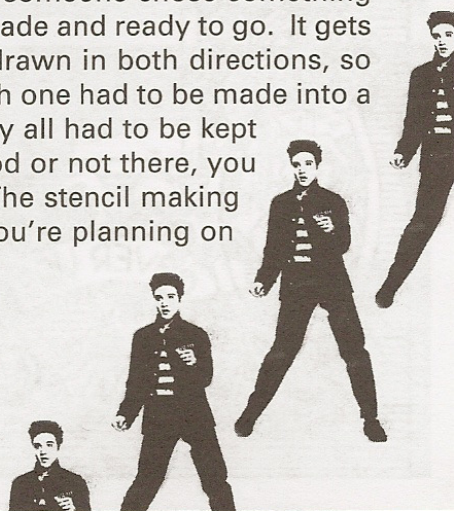
There is no substitute for experience and no fast track to obtaining it. Although these processes are outlined to maximize the possibility of successfully setting up your machine, experience at adjusting your machines will make fine tuning easier.

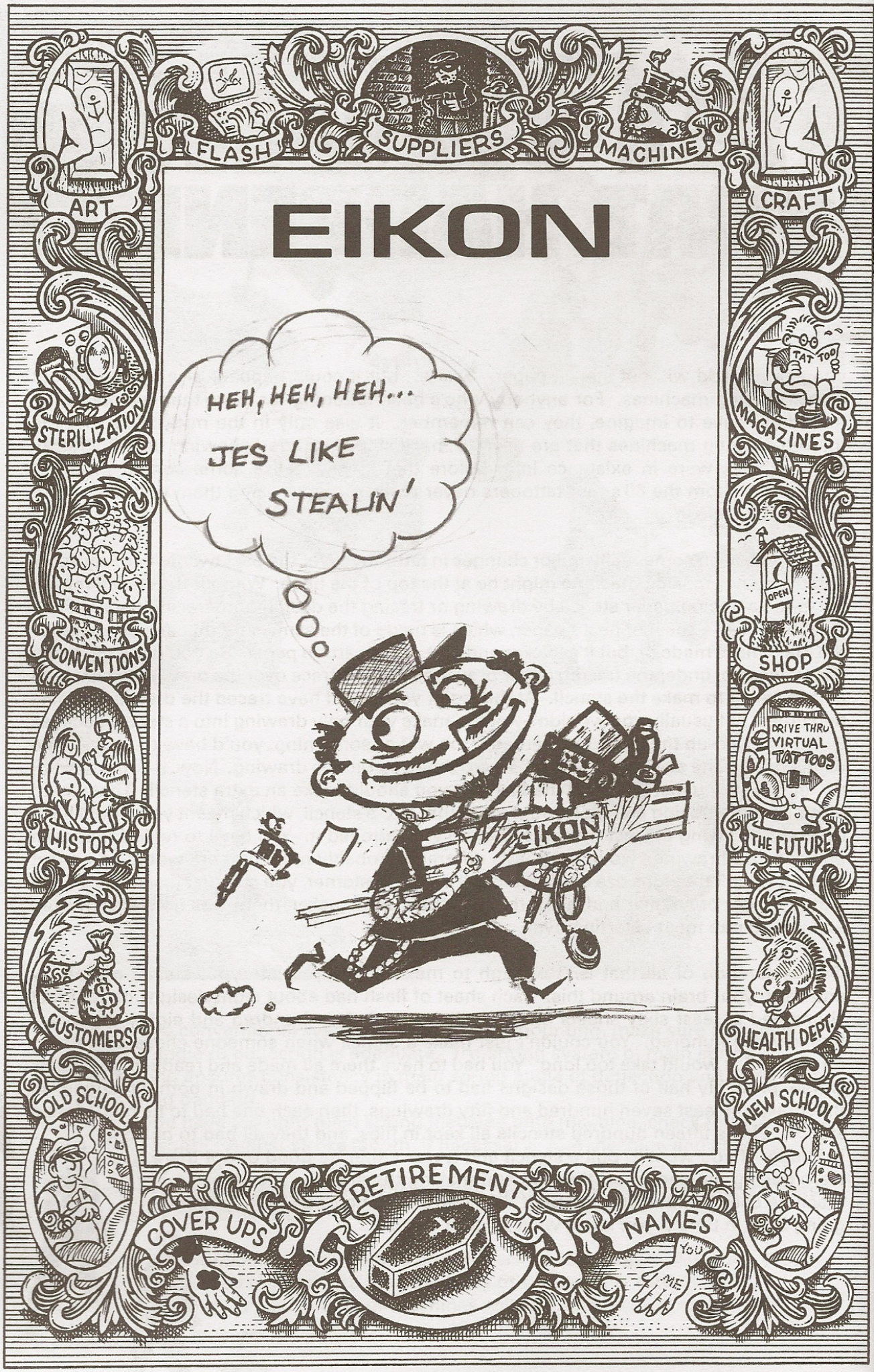
TATTOOING WHAT HAPPENED?

Imagine a world without stencil paper. Scary... but it could happen, or a world without stencil making machines. For anybody who's been tattooing for more than twenty years, they don't have to imagine, they can remember. It was only in the mid-1980's that the thermo-copying machines that are used to make stencils started showing up. Obviously the machines were in existence long before that. They're like some sort of primitive photocopier from the 60's, but tattooers never really got onto using them until they were already obsolete.

There have been some really major changes in tattooing over the past twenty or thirty years and the stencil making machine might be at the top of the heap. Without the stencil maker, we made a tracing paper stencil by drawing or tracing the design onto tracing paper. Then we would take a sheet of hecto paper, which is made of the same stuff that stencil paper for the machine is made of, but it's thicker and sort of like carbon paper. So you'd put the hecto paper, face up, under the tracing paper drawing and then trace over the drawing again, with a hard pencil to make the stencil. At this point you would have traced the drawing at least two times, but usually you wouldn't want to make your only drawing into a stencil, because if you screwed-up the stencil by getting it too wet or something, you'd have to re-draw the whole thing. The stencil would be the third time you did the drawing. Now, if you screwed-up regularly, you just accepted the fact that you should make an extra stencil. That would take one more tracing and then you'd make that into a stencil, which meant you would have done that drawing at least five times before you tattooed it. You have to realize that each one of those drawings would be a little different, probably none of them would be perfect and if it wasn't the right size once you put it on the customer, you couldn't just make a copy a little bigger or smaller and run it through the stencil maker, there was no stencil maker. The wrong size meant starting over.

If consideration of all that isn't enough to make you appreciate your stencil maker, try and wrap your brain around this. Each sheet of flash had about eight designs on it. Most shops had at least sixty sheets on the wall, so that's four hundred and eighty designs... let's say five hundred. You couldn't just make a stencil when someone chose something off the wall, it would take too long. You had to have them all made and ready to go. It gets worse, probably half of those designs had to be flipped and drawn in both directions, so that makes at least seven hundred and fifty drawings, then each one had to be made into a stencil. That's fifteen hundred stencils all kept in files, and they all had to be kept in shape. If you went to pull a stencil and it was either no good or not there, you were tracing the design off the wall and making the stencil. The stencil making machine changed everything. So if the shop's burning or if you're planning on going back in time... you know what to grab. **MGM**




FLASH
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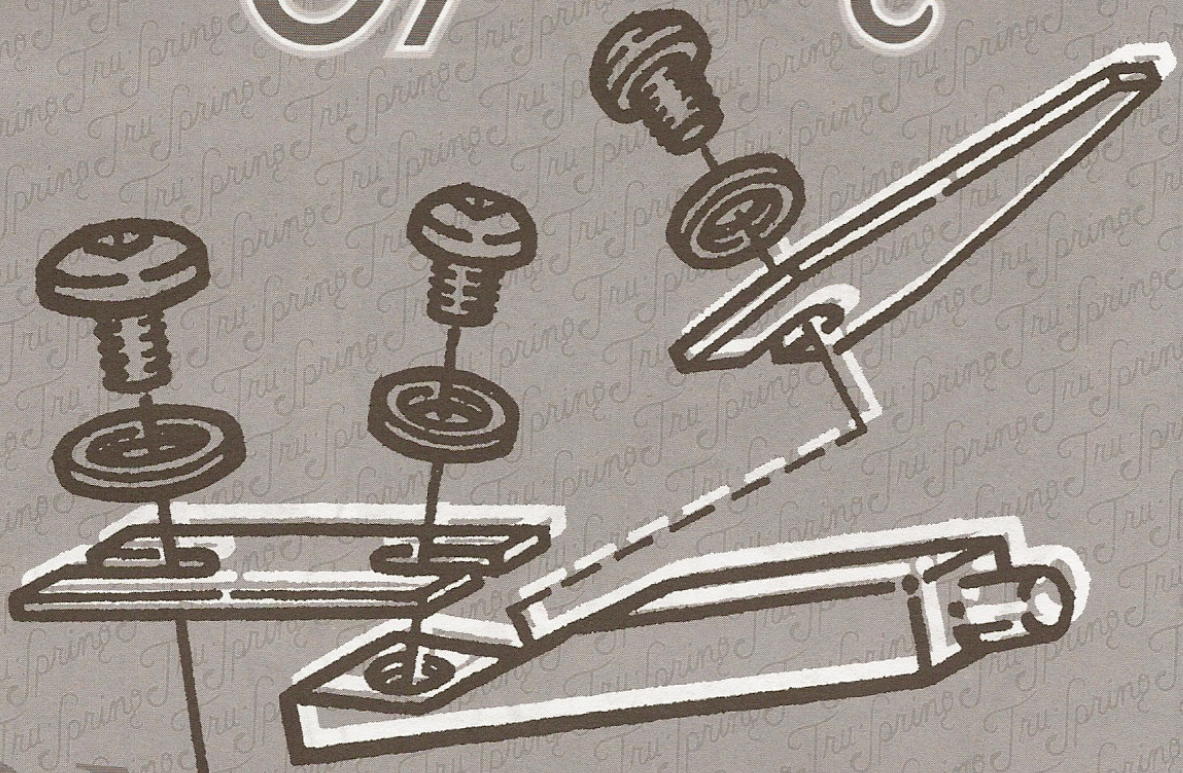
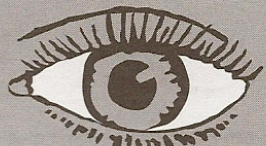
ARMATURE BARS AND SPRINGS

Tru-Spring



RMATURE
ND SPRING

KEEP YOUR...  on EIKON

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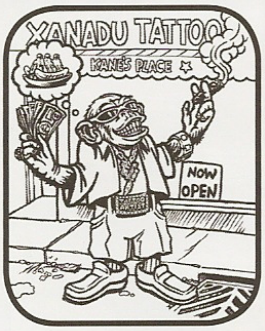
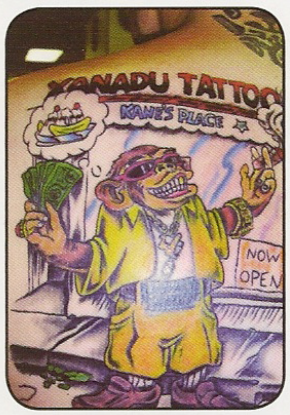
CONGRATULATIONS JOSEPH WOOD

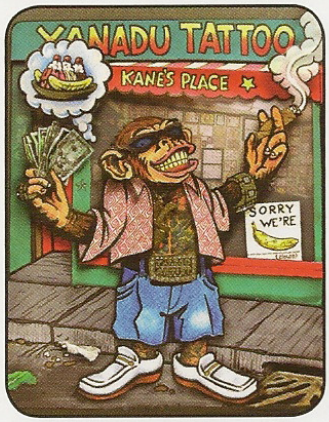
WINNER OF ISSUE 6 COLORING CONTEST

REALLY TATTOOED ON HIS BACK!!!





BUT THERE WERE SOME HONOURABLE MENTIONS!



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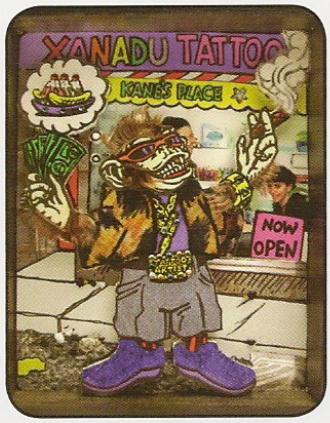
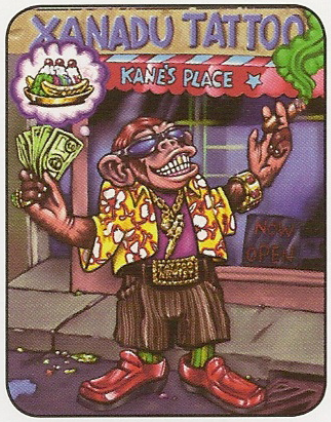
OF FORT WORTH, TX



LAURAINE LEBLANC
OF LANCASTER, CA



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